A DISSERTATION

ON

COMPARISON OF NEBULISED ADRENALINE, NEBULISED SALBUTAMOL AND NEBULISED BUDESONIDE IN THE TREATMENT OF BRONCHIOLITIS-A DOUBLE BLINDED RANDOMIZED TRIAL

Submitted to

THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,
CHENNAI

In partial fulfillment of the regulations
for the award of

M. D. DEGREE IN PAEDIATRICS
BRANCH VII

GOVERNMENT MOHAN KUMARAMANGALAM
MEDICAL COLLEGE, SALEM
APRIL 2017

Government Mohan Kumaramangalam Medical College Hospital

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T. Shanmuga priyadharsini

Place: Salem

Signature of the Candidate

Date: 5/10/16

DR.SHANMUGA PRIYADHARSINI .T

Government Mohan Kumaramangalam Medical College Hospital

SALEM

ENDORSEMENT BY THE DEAN OF THE INSTITUTION

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DEAN
Govt. Mohan Kumaramangalam Medical College Hospital, Salem - 636 001.

Seal & Signature of the Dean

Prof. KANAGARAJ, M.D.,
Dean
Govt. Mohan Kumaramangalam Medical College
Salem, Tamil Nadu, India.

Government Mohan Kumaramangalam Medical College Hospital

SALEM

ENDORSEMENT BY THE HEAD OF DEPARTMENT

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***Dr. T.S.SUNDARARAJAN, M.D,D.C.H.,* Professor and Head**, Department of paediatrics, Government Mohan Kumaramangalam Medical College Hospital, in partial fulfillment of the requirement for the degree of M. D. in Paediatrics, examination to be held in 2017.

Professor and Head
Department of Pediatrics
Govt.. Mohan Kumaramangal
Medical College & Hospi
SALEM - 636 001

Seal & Signature of the of the H.O.D

Dr. T.S.SUNDARARAJAN,M.D.,D.C.H.,
Professor & Head of the Department,
Department of Paediatrics,
Government Mohan Kumaramangalam
Medical College, Salem.

Government Mohan Kumaramangalam Medical College Hospital

SALEM

CERTIFICATE BY THE GUIDE

This is to certify that this dissertation **"COMPARISON OF NEBULISED ADRENALINE,NEBULISED SALBUTAMOL AND NEBULISED BUDESONIDE IN THE TREATMENT OF BRONCHIOLITIS"** is a bonafide work done by **Dr.SHANMUGA PRIYADHARSINI .T** in partial fulfillment of the requirement for the degree of M. D. in PAEDIATRICS, examination to be held in 2017.

PROFESSOR,
Department of Paediatrics,
GMKMCH, SALEM.

Signature of the Guide

Dr. P.SAMPATH KUMAR M.D.,D.C.H.,
Associate Professor
Department of peadiatrics
Govt. Mohan Kumaramangalam Medical College
Salem,Tamil Nadu, India .

Government Mohan Kumaramangalam Medical College Hospital

SALEM

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation titled **"COMPARISON OF NEBULISED ADRENALINE, NEBULISED SALBUTAMOL AND NEBULISED BUDESONIDE IN THE TREATMENT OF BRONCHIOLITIS –A DOUBLE BLINDED RANDOMIZED TRIAL"** is a bonafide and genuine research work carried out by me under the guidance of

DR.P.SAMPATH KUMAR, M.D, D.C.H, associate Professor, Department of Paediatrics, Government Mohan Kumaramangalam Medical College Hospital, Salem, Tamil Nadu, India.

T. Shanmuga priyadharsini

Signature of the Candidate

Place : Salem

Date : 5/10/16

DR.SHANMUGA PRIYADHARSINI.T

I feel greatly indebted to **Prof.KANAGARAJ, M.D.**, Dean, Govt. Mohan Kumaramangalam Medical College, for permitting me to undertake this study.

I would like to express my humble gratitude and sincere thanks to **Prof. Dr.T.S.SUNDARARAJAN, M.D., D.C.H**, Head of the Department of Pediatrics, Govt. Mohan Kumaramangalam Medical College and Hospital, Salem for his excellent guidance and encouragement during this study.

I sincerely thank my Associate Professor **Dr. P..SAMPATH KUMAR M.D., D.C.H** for his invaluable guidance to complete this dissertation.

I am thankful to **Dr. D. SAMPATH KUMAR, M.D., DCH,** Associate Professor of Paediatrics for his guidance and help for completion of this dissertation in time.

I am thankful to all my Assistant Professors

Dr.P.KANIMOZHI DCH,M.D., Dr. SURESH KANNAN, M.D.,

Dr.GOBINATHAN,MD.DCH., Dr.P.VASUMATHY, M.D.,

Dr.V.NARMADHA,M.D., Dr.M.NIRMALA,M.D.DCH,

Dr.V.ANUREKHA,M.D., Dr.AMUDHADEVI M.D., Dr.BALAJI,M.D.,

Dr.SASIVARADHAN,M.D,

Dr.LOGESH ANAND,M.D, Dr. KUMAR,M.D.,D.C.H., Department of Pediatrics, for their valuable suggestions

I am ever thankful to my sister, **Dr. T.UMA PRIYADHARSINI ,MD SPM., and Dr. DAMODARAN , MD SPM**. who helped me a lot in completing my thesis.

Above all I would like to express my whole hearted gratitude towards **my father Mr.A.THULASIMANI, my mother Mrs .K. VATHSALA,** my husband **Dr.VIJAYARAVINDH , MD (Pul med)).,** and all my family members for being the source of constant support and encouragement.

I thank all my PG colleagues, friends and staff members of the department of Pediatrics who helped me a lot in completing this dissertation successfully.

I am ever thankful to Mrs.Malathi ,who helped me a lot in getting my thesis completed.

Last but not the least; I bow my head in reverence to all our patients who formed the back bone of this study without whom this would not have been possible.

ABSTRACT

BACKGROUND:

Acute bronchiolitis is the most common condition in children with rapid respiration, chest retractions, and wheezing.[1] RSV is the most common cause for acute bronchiolitis. Up to 3% of all children are hospitalized with acute bronchiolitis in their first year of life.[9] Despite the high prevalence of acute bronchiolitis, little consensus exists on the optimal management of the disease.[10] Management of acute bronchiolitis is mainly supportive. Various bronchodilators have been used in the treatment. None have been found to be efficacious.

AIMS AND OBJECTIVES:

To compare the effectiveness of nebulised adrenaline ,nebulised salbutamol and nebulised budesonide in the treatment of acute bronchiolitis in terms of clinical improvement, decrease in respiratory distress and duration of hospital stay.

MATERIALS AND METHODS:

Children in the age group of 2 months to 2 years with bronchiolitis admitted in the Pediatric ward, Government Mohan Kumaramangalam Medical College Hospital,salem.It is a Hospital based prospective interventional double blinded randomized trial.

All cases of acute bronchiolitis with a Respiratory Distress Assessment Instrument (RDAI) score of 4 to 15 [on a scale of 0 (mild) to 17 (severe) were included.The children were randomised into 3 groups. The drugs A, B and C were given according to the random number. The drugs were not disclosed initially. All children received supportive care.

STATISTICAL ANALYSIS:

Data were analyzed using SPSS 23. Statistical methods used were t test, chi square test and Anova .

RESULTS:

Out of 90 enrolled in our study, 30 were given drug A,another 30 were given drug B and another 30 were given drug C. There was improvement in all the 3 Groups in terms of HR, RR, and RDAI. GROUP B had significant improvement compared to other Groups. Group B drug was found to be ADRENALINE.

CONCLUSION:

Group B that is use of nebulised adrenaline brought about symptomatic improvement in the decrease in tachycardia, tachypnoea and RDAI score and the difference was significant. Hence Group B, nebulised adrenaline was found to be effective in acute control of symptoms. However, saturation and duration of hospital stay did not vary between the groups.

KEY WORDS:

Bronchiolitis; Nebulised Adrenaline; Randomised

Ref. No.2623/MEI/P.G/2015

Office of the Dean,
Govt. Mohan Kumaramangalam
Medical College, Salem – 30.
Dated: 29 .06.2015.

Ethical Committee Meeting held on 18.06.2015 at 10.00 A.M in the Seminar Hall, IInd Floor, Medicine Block, Govt. Mohan Kumaramangalam Medical College Hospital, Salem 01.

The following Members were attended the Meeting.

MEMBERS:

1. Dr. V. Dhandapani, MD., Deputy Chairman, External Social Scientist, ECIRB.
2. Dr. S. Mohamed Musthafa, MD., Vice Principal, Govt. Mohan Kumaramangalam Medical College, Salem.
3. Mr. S. Shanmugam, B.Sc., BL, Advocate, External Legal Expert.
4. Dr. S. Subramaniam, B.Sc., C.A., Chartered Accountant, External Lay person, Subramanium Vasudev & Co, Charted Accountants, 11 Second Street, Dr. Thirumuruthi Nagar, Nungambakkam, Chennai – 600 034.
5. Dr. S. R. Subramanian, MD., HOD of Medicine, Govt. Mohan Kumaramangalam Medical College Hospital, Salem.
6. Dr. C. Rajasekaran, MS., Professor and HOD of Surgery, Govt. Mohan Kumaramangalam Medical College Hospital, Salem.
7. Dr. N. Geetha, MD., Associate Professor of Obstetrics & Gynaecology, Govt. Mohan Kumaramangalam Medical College Hospital, Salem.
8. Dr. S. Vijayarangan, MD., Associate Professor of Pharmacology, Govt. Mohan Kumaramangalam Medical College, Salem.

Sl. No.	Name of the Presenter with Address	Title	Name of the Guide and Address	Whether it is Approved or not.
1.	Dr. T. Shanmuga Priya Dharsini, II Year, Post Graduate Student of MD (Paediatrics), GMKMC, Salem-30.	"A comparison of nebulised adrenaline, nebulised salbutamol and nebulised budesonide in the treatment of bronchiolitis – A double blinded randomized trial".	Dr. P. Sampath Kumar, MD., DCH., Associate Professor of Paediatrics, GMKMC, Salem-30.	Approved

The Ethical Committee examined the studies in detail and is pleased to accord Ethical Committee approval for the above Post Graduate student of this College to carry out the studies with the following conditions.

1. She should carry out the work without detrimental to regular activities as well as without extra expenditure to the institution to Government.
2. She should inform the institution Ethical Committee in case of any change of study procedure site and investigation or guide.
3. She should not deviate from the area of the work for which applied for Ethical clearance. She should inform the IEC immediately, in case of any adverse events or serious adverse reactions.
4. She should abide to the rules and regulations of the Institution.
5. She should complete the work within the specific period and if any extension of time is required she should apply for permission again and do the work.
6. She should submit the summary of the work to the Ethical Committee on completion of the work.
7. She should not claim any funds from the institution while doing the work or on completion.
8. She should understand that the members of IEC have the right to monitor the work with prior intimation.

29/06/15
DEAN

LIST OF ABBREVIATIONS

ARI	Acute Respiratory Infections
AAP	American Academy of Paediatrics
ELISA	Enzyme Linked Immunosorbent Assay
HMPV	Human MetaPneumoVirus
PICU	Paediatric Intensive Care Unit
RCT	Randomised Control Trial
RDAI	Respiratory Distress Assessment Instrument
RSV	Respiratory Syncitial Virus
RNA	RiboNucleic Acid
SIRS	Systemic Inflammatory Response Syndrome
SpO2	Oxygen Saturation
UK	United Kingdom
USA	United States of America
WHO	World Health Organisation
HR	Heart Rate
RR	Respiratory Rate
TEMP.	Temperature
ABG	Arterial Blood Gas
CO2	Carbon Dioxide
PCR	Polymerase Chain Reaction

O2	Oxygen
ECMO	ExtraCorporeal Membrane Oxygenation
BPD	BronchoPulmonary Dysplasia
CPAP	Continuous Positive Airway Pressure
SD	Standard Deviation
Ig	Immunoglobulin

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PROFORMA

TITLE OF THE STUDY:

COMPARISON OF NEBULISED ADRENALINE, NEBULISED SALBUTAMOL AND NEBULISED BUDESONIDE IN THE TREATMENT OF BRONCHIOLITIS.

By : Dr. SHANMUGA PRIYADHARSINI.

GUIDE: Dr. SAMPATHKUMAR.P

CASE No:

NAME :

AGE:

SEX

ADDRESS:

IP No:

DATE OF ADMISSION:

PRESENTING COMPLAINTS: PRESENT/ABSENT

DURATION

1. Cold, Rhinorrhea :
2. Cough :
3. Fever :
4. Wheeze :
5. Fast breathing :
6. Chest Indrawing :
7. Other complaints : if any specify :

PAST HISTORY :

Any history of similar illness in the past : Y/N

Any history of receiving corticosteroids in the past : Y/N

FAMILY HISTORY :

Any history of asthma in the family members : Y/N

BIRTH HISTORY :

BENERALK PHYSICAL EXAMINATION:

VITAL SIGNS

Temperature :

Pulse :

Respiratory rate :

Heart rate :

SpO_2 (Without O_2) :

(With O_2) :

ANTHROPOMETRY :

PARAMETER	OBSERVED	EXPECTED	REMARKS
Height			
Weight			
Head Circumference			
Chest Circumference			
MAC			

Pallor, Icterus, Cyanosis, Clubbin, Lymphadenopathy, Edema.

OTHER FINDINGS (If any) :

SYSTEMIC EXAMINATION :

RESPIRATORY SYSTEM :

CORDIOVASCULAR SYSTEM :

PER ABDOMEN :

CENTRAL NERVOUS SYSTEM :

CLINICAL DIAGNOSIS :

INVESTIGATIONS :

1. Hb :
2. Total WBC :
3. Differential count :
4. Chest X-Ray :
5. Urine routine :
6. Blood Culture :
7. Urine Culture :

TREATMENT RECEIVED :

DID THE PATIENT RECEIVE ANTOBIOTICS (if Yes, why?)

COURSE IN THE HOSPITAL :

INFORMED CONSENT FORM

I have read the fore going information, or it has been read to me. I have been explained about the disease, risks involved, various treatments available for it in my own vernacular language. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily for my child to participate as a participant in this study.

I understand that the information collected about my child foirm my participation and medical information hence gathered may be looked at by responsible individuals and regulatory authorities where it is relevant, in my child taking part in research. I give permission for these individuals to have access to my child's records.

Signature

KEYS TO MASTERCHART

A	Nebulised adrenaline group
B	Oral dexamethasone group
C	Nebulised adrenaline + Oral dexamethasone group
M	Male
F	Female
P	Present
N	No
Y	Yes
Ph. No	Phone number
Mnths	Months
V	Vaginal delivery
C	Caesarean delivery
Wt.	Weight
NICU	Neonatal Intensive Care Unit
Temp.	Temperature
PR	Pulse Rate
HR	Heart Rate
RR	Respiratory Rate
SpO2RA	Saturation at Room Air
SpO2 O2	Saturation with oxygen

RDAI	Respiratory Distress Assessment Instrument
SAM	Severe Acute Malmutrition
PICCLE	Pallor, Icterus, Cyanosis, Clubbing, Lymphadenopathy
ICR	InterCostal Retractions
SCR	SubCostal Retractions
Crepts	Crepitations
Hb%	Haemoglobin %
TC	Total Count
DC	Differential Count
P	Polymorphs
L	Lymphocytes
E	Eosinophils
M	Monocytes
CXR	Chest X-Ray
NAD	No Abnormalities Detected
Rt.	Right side
Lt.	Left side
h/o	History of neb. Nebulisation
BA	Birth Asphyxia

INTRODUCTION

Acute bronchiolitis means inflammation of the bronchioles. In a child younger than 2 years of age, bronchiolitis refers to a clinical syndrome usually characterized by rapid respiration, chest retractions, and wheezing[1]. Acute bronchiolitis is one of the major causes for hospital admissions of infants younger than 1 year of age; most commonly, it affects infants between 2 and 6 months.[2] The infant characteristically presents with a viral infection with rhinorrhoea, cough, a low-grade fever and within 1 or 2 days, the symptoms are followed by onset of rapid respiration, chest retractions and wheezing. The infant can show irritability, poor feeding, and vomiting.[3]

In very young or premature infants, however, the presentation of disease is atypical and has features of severe pneumonia.[4] In general, only infants older than 1 month develop the clinical syndrome of acute bronchiolitis.[5] Risk factor of acute bronchiolitis usually include low levels of antibodies in cord blood, gender, birth month, absence of or minimal breast feeding, crowded living conditions, being a twin or triplet, low socio-economic status, and cigarette smoking mothers.[6-8] . More than 50% of cases of bronchiolitis are caused by RSV. Others include parainfluenza, adenovirus, mycoplasma, rhinovirus, human metapneumovirus and bocavirus.[11,13] Around 3% of all children are

hospitalized with acute bronchiolitis in their first year of life.[9] Despite the high prevalence of acute bronchiolitis, little consensus exists on the optimal management of the disease.[10]

Management of acute bronchiolitis is mainly supportive. Humidified oxygen is delivered via nasal cannulae or into a headbox; the concentration required is determined by pulse-oximetry. The infant is monitored for apnoea. Nebulised bronchodilators, such as salbutamol or ipratropium, though often used,there is no evidence that bronchodilators have a role in the treatment of bronchiolitis. Fluids may need to be given by nasogastric tube or intravenously.[11] Mechanical ventilation may be required in about 2% of infants admitted to hospital.[10] Various other treatments have been proposed for acute bronchiolitis. They are other bronchodilators like adrenaline, inhaled and systemic steroids, aerosolised human DNAase, ribavirin, antibiotics, leukotriene receptor antagonists, heliox, ventilation,immunoglobulins. Among them the use of nebulised adrenaline, nebulised budesonide in the treatment of bronchiolitis in infants is still in controversy.[10] Hence the current study was undertaken to compare the efficacy of nebulised adrenaline ,nebulised salbutamol and nebulised budesonide in decreasing the respiratory distress and duration of hospital stay among children with acute bronchiolitis.

AIMS AND OBJECTIVES

To compare the effectiveness of nebulised adrenaline,nebulised salbutamol and nebulised budesonide in the treatment of acute bronchiolitis in terms of clinical improvement, decrease in respiratory distress and duration of hospital stay.

REVIEW OF LITERATURE

DEFINITION

Acute bronchiolitis is defined as the first episode of respiratory distress,usually viral, accompanied by cough, coryza and wheezing.[12] It is a clinically diagnosed respiratory condition presenting with breathing difficulties, cough, poor feeding, irritability and in the very young infants, apnoea.

The American Academy of Pediatrics (AAP) guidelines defines acute bronchiolitis as "a constellation of clinical symptoms and signs including a viral upper respiratory prodrome followed by increased respiratory effort and wheezing in children less than 2 years of age."[13,15]

The Scottish Intercollegiate Guidelines Network defines acute bronchiolitis as "a seasonal viral illness characterised by fever, nasal discharge and dry wheezy cough; examination of the chest revealing crepitations and/or wheeze."[9]

It may occur in children upto 2-3 yrs however it is known to peak around 2-6 mnths. There is involvement of lower respiratory tract within 4-6 days after the onset of upper respiratory tract infection with appearance of clinical signs of cough, tachypnoea, hyperinflation, chest retractions, widespread crackles and wheezing.[10]

The differences in definition account for the variability in study results so uniformity is essential to allow comparison between studies which are performed in different parts of the world.[11]

EPIDEMIOLOGY

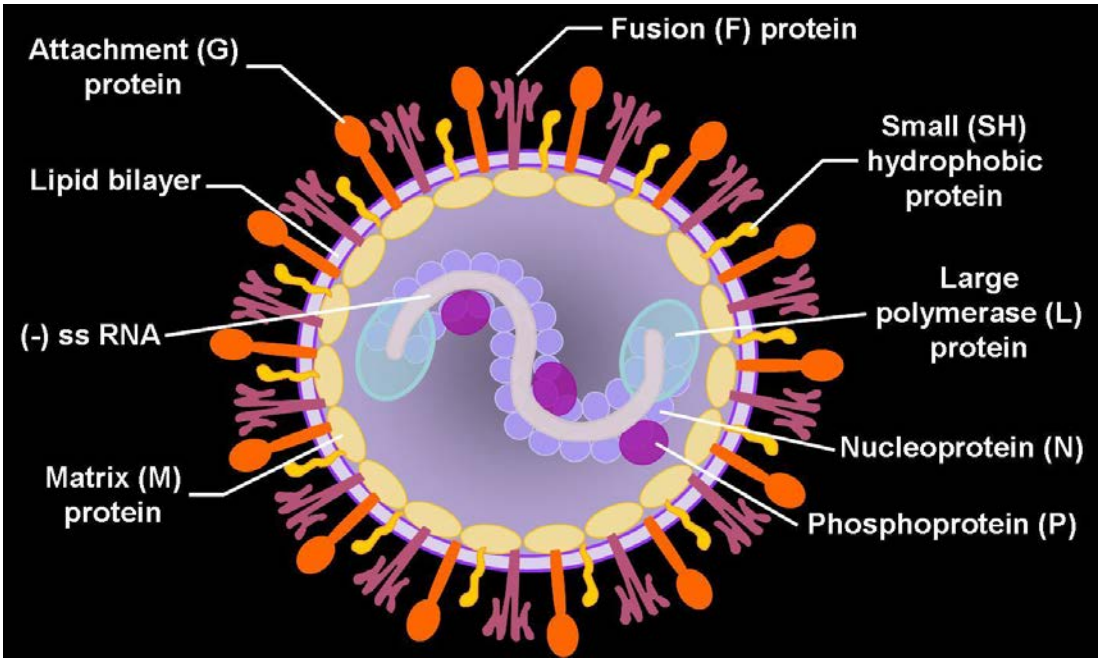
Acute bronchiolitis is still the leading cause of hospitalization for infants younger than 1 year. Around >50% of all infants are infected with RSV in their first year of life and 22% develop symptomatic disease. Around 3% of all infants younger than one year are admitted to hospital with acute bronchiolitis.[9]

In the United States, around 700,000 infants are hospitalized each year with bronchiolitis, one-third of them require in-patient treatment, resulting in a calculated annual cost of approximately 500 million dollars.

Although bronchiolitis occurs mostly in the winter months November to March), it can occur year around.[11] More than half of the patients of acute bronchiolitis have recurrent episodes of wheezing till 7-11 yrs of age. Pharmacological treatment of bronchiolitis is frequent practice, although no universal consensus as to the efficacy or standard treatment exists.[11]

ETIOLOGY

Acute bronchiolitis was initially thought to be complication of measles and mumps. [11]Acute bronchiolitis is commonly caused by viral infection, with RSV accounting for 50%-80% of cases. Other causes are adenovirus, parainfluenza viruses, influenza virus, human metapneumovirus rhinovirus, human bocca virus, Chlamydia pneumonia and corona virus.RSV is a single-stranded negative-sense, RNA virus of the family Paramyxoviridae, subfamily Pneumoviridae. Two strains of the virus (A and B) and a large number of serotypes and genotypes have been identified as human pathogens. Among the acute bronchiolitis caused by the 2 strains, there is difference in outcome parameters such as length of hospital stay, intensive care admission and supplemental oxygen requirement.[20]



PATHOGENESIS

Acute bronchiolitis caused by RSV, results from infection and inflammation of respiratory mucosa. Symptoms are a consequence of partial obstruction of distal airways. Histologic examination shows respiratory epithelial necrosis, monocytic inflammation with peribronchial oedema and distal airway obstruction with mucus and fibrin plugs. Infants are predisposed due to smaller distal airways and absence of active immunity against RSV and other viruses.

Viral replication induces the production of inflammatory mediators by epithelial respiratory cells, contributing to the disease. Respiratory epithelial cell desquamation, mucosal oedema, and increased airway smooth muscle reactivity cause the respiratory symptoms. The relationship between disease severity and multiple virus co-infection is

not clear.[10] The respiratory viruses cause inflammation and necrosis of the airway mucosa.

The inflammation and necrosis of the airway exposes the irritant receptors, which, when stimulated by deep breaths, cause coughing. To prevent coughing and reduce the work of breathing, infants and children breathe shallow and rapidly. Along with partial obstruction of small airways, this breathing pattern tends to trap a portion of each breath and leads to hyperinflation. Deep breaths are accompanied by rales and expiratory wheezing and usually are followed by a paroxysm of coughing. Cyanosis may occur and be most marked during sleep when the drive to respiration is blunted.

Hypercapnia is a common feature in infants who are less than one year of age, particularly when they are agitated or coughing. In addition to cough, stimulation of the irritant receptors also causes reflex constriction of the larynx. Increased nasopharyngeal secretions can cause further upper airway obstruction and increase the work of breathing.[11]

CLINICAL FEATURES

Acute bronchiolitis occurs mainly in winter but can occur in other seasons. Parents report their children attend day-care centres or had contact with those who had cold symptoms. In the beginning of the

disease, children have rhinorrhoea and typically have cough along with poor feeding with a peak from 4-6 days of onset of illness.

Children with RSV causing acute bronchiolitis usually have fever of 38.5^0 C and that caused by other viruses have fever >39 ^{0}C. Infants with acute bronchiolitis have tachypnoea, mild to moderate hypoxia, and signs of respiratory distress, such as nasal flaring and respiratory muscle use. Physical examination reveals audible wheezing, crackles, rhonchi and prolonged expiration. Other findings are conjunctivitis and acute rhinitis. Abdominal distension might also be present due to pulmonary hyperinflation.[10]

CLINICAL SEVERITY SCORE

There are two clinical severity scoring systems that have been commonly used for randomized trials involving infants with acute bronchiolitis. One is the Respiratory Distress Assessment Instrument (RDAI),and the other clinical severity score described by Wang et all [22], which assessess the respiratory rate, wheezing, retraction, general condition providing score of 10 to12. A clinical score of less than 4 is considered as mild disease, a score between 4 and 8 as moderate disease any score more than 9 as severe disease Respiratory distress assessment instrument (RDAI) provides a score ranging from 0 to 17, with a higher score indicating

more severe respiratory distress[25]. The components of the score as shown in the table below

Table 1:RDAI SCORE

	0	1	2	3	4	Total
Wheezing						
Expiration	None	End	1/2	¾	All	4
Inspiration	None	Part	all	-	-	2
Lung fields	None	<2/4	>3/4	-	-	2
Retractions						
Supraclavicular	None	Mild	moderate	marked	-	3
Intercostal	None	Mild	moderate	marked	-	3
Subcostal	None	Mild	moderate	marked	-	3
Total						17

PROGNOSIS:

Most children improve without any sequelae. The natural course of thedisease lasts for 7-10 days, however some children remain ill for weeks. Children predisposed to asthma may wheeze more when infected with RSV or exposed to allergic stimulus.

The mechanism of post-bronchiolitis wheezing is unknown, whether virus is the cause for persistant wheezing or wheezing is the consequence of airway disease.[10]

INVESTIGATIONS

Bronchiolitis is a clinical diagnosis.[13] AAP does not support the use of diagnostic tests in the diagnosis of bronchiolitis.[15] A mild leukocytosis with normal differential count may be present. Hypoxia is detected by pulse-oximetry or ABG analysis. CO2 retention may be seen in some infants. Pulse-oximetry is one of the most useful non invasive tools that can aid in treating a child with bronchiolitis. It can help in assessing the degree of hypoxia as well as aid in evaluating the response of oxygen therapy.[23]

Viruses from nasal samples can be detected by indirect fluorescent antibody detection, PCR, radioimmunoassay or direct culture. Virus diagnosing test may be used to link appropriate use of antibiotics. Chest X-ray may show hyperinflation, gross infiltrates which are migratory and attributable to postobstructive-atelectasis and peribronchial filling. When true alveolar infiltrates are seen secondary bacterial infection must be suspected. Pleural effusion is rare.[10]

MANAGEMENT

The history of acute bronchiolitis is a self limiting disease that usually lasts 7-10 days, and thus management is usually supportive.[21,14] Most of the children with acute bronchiolitis will have a very mild disease and can be managed at home with supportive care from primary physician. Indications for hospitalisation include poor feeding, lethargy, history of apnoea, respiratory rate >70/min, presence of nasal flaring and/or grunting, severe chest wall recession or oxygen saturation less than 94%.[14] Care in the Paediatric ICU is advised for infants with hypoxemic respiratory failure (need for supplemental oxygen >40%), cyanosis, repeated episodes of prolonged apnoea, or respiratory and/or metabolic acidosis.[25]

TREATMENT

Treatment for acute bronchiolitis includes supportive care, Assisted feeding, minimal handling, gentle nasal suctioning and oxygen therapy[14] are the most common forms of supportive care.

OXYGEN THERAPY:

Adequate oxygenation is the main stay of therapy for Bronchiolitis.[14] In the UK, supplemental oxygen therapy is administered for oxygen saturation <95%, while AAP recommends its use only if oxygen saturations fall below 94% in previously healthy infants[14] O2 is given via nasal prongs and ensured SpO2 >94%. The significance of hypoxemia

with saturations below 95% as it relates to bronchiolitis outcomes has not been specifically studied and the thresholds for administering supplemental oxygen vary widely.[10]

HYDRATION THERAPY:

Hydration is essential, oral/enteral fluids or when feedings is not tolerated, intravenous fluids. Fluids become important. Half of uncomplicated cases may require intravenous fluids. Careful monitoring mainly of the sick and high-risk children, is important, in order to prevent further complication.[10]

BRONCHODILATORS:

Bronchodilators are beta-2 agonists, adrenaline, ipratropium and theophylline. These are useful where bronchoconstriction contribute to wheezing. While beta-2 agonists were effective and reduced the need for intubation and mechanical ventilation, ipratropium was not as effective as beta -2 agonists. No studies have been conducted to evaluate the effectiveness of theophylline. It was found beta-2 agonists may increase mucosal blood flow, hence increase thickness and oedema and increase wheezing and respiratory distress, in addition excessive use may increase O2 consumption, further exacerbating respiratory failure.

Adrenaline is likely to be more effective. It was found to reduce interstitial oedema by its alpha agonistic activity and open small airways by its beta agonistic activity. A recent Cochrane review showed small

improvement in clinical scores but no change in hospitalisation. A large RCT and a Cochrane review concluded that there is insufficient evidence to support the use of adrenaline in inpatients with acute bronchiolitis; however, adrenaline may be preferred over salbutamol or placebo among outpatients, although admission rates were not significantly different.

Inhaled bronchodilators are used in the treatment of acute bronchiolitis. Numerous clinical trials and systematic reviews examined the role of bronchodilators in the treatment of acute bronchiolitis. A recent meta-analysis of RCTs comparing bronchodilators with placebo in the treatment of acute bronchiolitis including 1428 infants concluded that bronchodilators produce short-term improvements in clinical scores but no significant improvement in oxygenation overall or in the rate of hospital admission.[17]However the AAP does not recommend the use of bronchodilators routinely in the management of acute bronchiolitis.[15]

INHALED AND SYSTEMIC CORTICOSTEROIDS:

Corticosteroids both inhaled and systemic neither produce any improvement in clinical scores nor decrease the length of hospital stay.[17] They are used for mild or moderate bronchiolitis treatment. Severely ill children who are receiving mechanical ventilation may be benefited but these do not prevent bronchospasm following it. The anti-inflammatory effect of steroids may be useful.[12,17] Systemic steroid therapy has no

immediate effect but inhaled steroids may be tried during the recovery period to reduce short term morbidity.[24]

AEROSOLISED HUMAN DNAase :

The use of aerosolised human DNAase was associated with improvement in chest X-ray score, but not much differences in RR, wheezing and retractions were seen when compared with control groups. Mucus in patients with bronchiolitis, cystic fibrosis, bronchiectasis was found to contain DNA.

It increased the adhesiveness and viscosity of secretions. DNAase may also be useful in infections complicated by atelectasis, bronchial secretions and mucus plugs. There was quick clinical improvement after 2 hrs and radiologic improvement after 24 hrs in children without cystic fibrosis and with bronchial secretions.

ANTIVIRAL THERAPY

Ribavirin is a broad-spectrum antiviral agent used in the treatment of RSV infection, and is the only antiviral drug that has been studied in children with acute viral bronchiolitis. Ribavirin inhibits the structural protein synthesis of the virus, reduces viral replication and immunoglobulin (IgE) E response.[10] Its use, however, is controversial because of the questions about its efficacy, safety concerns, and its high cost.

Ribavirin may reduce the duration of mechanical ventilation and days of hospitalisation, and may decrease the incidence of recurrent wheezing following bronchiolitis; however, in the absence of large RCTs, the effect of ribavirin remains unproven.[17] Ribavirin, at present is not recommended for use routinely in children with acute bronchiolitis.[17,15,14]

The American Academy of Pediatrics has recommended the use of ribavirin in infants with congenital heart disease or chronic lung disease, impaired, multiple abnormalities, preterm infants and those less than 6 weeks of age, and infants ventilated for RSV infection.[30]

ANTIBIOTICS:

Antibiotics have no benefit in treating RSV but are important in treating secondary bacterial infection, such as streptococcus and staphylococcus.[10.] Antibiotics form mainstay of treatment when there is evidence of infection or sepsis. Sepsis is defined by the presence of 2 or more of the following-

Temperature instability <35 or >38.50 C

Respiratory dysfunction

Tachypnoea > 2 SD above the mean for age

Hypoxemia (PaO_2 < 70 mm Hg at room air)

Cardiac dysfunction

Tachycardia > 2 SD above the mean for age

Delayed capillary refill time > 3 sec

Perfusion abnormalities

Oliguria (urine output < 0.5 ml/kg/hr)

Lactic acidosis (elevated plasma lactate and/or arterial pH <7.2) Altered mental status

Only one trial was included comparing antibiotics with placebo. It showed that antibiotics are no better than placebo in reducing the length of illness of bronchiolitis. Antibiotics need to be used cautiously owing to the side effects, cost to the patient and the community and increasing bacterial resistance to antibiotics.[49]

LEUKOTRIENE RECEPTOR ANTAGONISTS:

Cysteinyl leukotrienes are significantly increased in respiratory secretions from infants with acute viral bronchiolitis and remain so at short-term follow-up, suggesting a possible role of these substances in the pathogenesis of the disease. An RCT compared montelukast, a specific cysteinyl leukotriene receptor antagonist, with placebo in infants with a first episode of bronchiolitis found that montelukast did not improve length of stay, clinical severity scores or cytokine levels in nasal lavage

fluid.[17,12] AAP does not routinely recommend its use in the management of acute.[15]

HELIOX:

The helium-oxygen mixture reduces the work of breathing and expiratory wheezing in children with obstructive disease. This therapy avoids respiratory failure and intubation. A case report by Paret and colleagues examined the use of heliox in a 4-month-old child with RSV bronchiolitis and impending respiratory failure. The administration of heliox (70% helium, 30% oxygen) averted the need for intubation and mechanical ventilation.[10] Hollman et al further examined the effect of heliox in a randomized, double-blind, placebo-controlled study of patients admitted to a pediatric intensive care unit (PICU) with RSV bronchiolitis and showed that it eases respiratory distress in children with acute bronchiolitis. They also concluded that the combination of continuous positive upper airway pressure and heliox can reduce the need for intubation and mechanical ventilation.[27]

HYPERTONIC SALINE:

Airway oedema and mucus plugging are the predominant pathological features in acute bronchiolitis. Hypertonic saline decreases airway oedema, improves mucociliary clearance, and thus decreases airway obstruction.[17] A recently published Cochrane Review of four trials involving 254 infants with acute bronchiolitis found that 3% saline results

in a significantly shorter length of hospital stay as well as a lower clinical score.[26,12] While there is a lack of strong evidence to support the routine use of aerosolised hypertonic saline solution in children with acute viral bronchiolitis, minimal side effects and the limited cost of the treatment make this modality to deserve consideration for a large RCT.[17]

RESPIRATORY PHYSIOTHERAPY:

The recommended treatment for children with bronchiolitis is based on positioning therapy, alveolar recruitement, expiration airflow increase using hand vibration and airway aspiration. Airway suctioning is an effective measure for tracheobronchial hygiene.

Approximately 60% of respiratory resistance is in upper airways, hence clearance of these secretions may relieve the symptoms and reduce the work of breathing.[10]

EXTRACORPOREAL MEMBRANE OXYGENATION:

ECMO is used when severely ill children cannot be supported by conventional ventilation due to their ventilation and cardio-circulatory condition. Use of ECMO for RSV is infrequent.[10] In a study conducted by Flamant et al. out of 151 children 14 required ECMO with a mean duration of 12.1 days, with mechanical ventilation of 3.9 days before ECMO. The frequency of BPD was significantly higher among these infants.[29]

INHALED NITRIC OXIDE:

Inhaled nitric oxide is used in those with severe hypoxemia and those who are refractory to ventilatory support. It is known to improve oxygenation and respiratory system resistance.[10]

EXOGENOUS SURFACTANT:

Children infected with bronchiolitis by RSV have surfactant deficiency in both quantity and ability to decrease alveolar surface tension. Surfactant may have a role in maintaining the patency of small airways as well as on the lung compliance. But its clinical use remains infrequent.[10]

CONVENTIONAL MECHANICAL VENTILATION:

Conventional mechanical ventilation in control-pressure ventilation mode is used for those children with obstructive or restrictive hypoxemia, however mixed mode (pressure regulated, volume controlled mode) can also be used.[10]

HIGH-FREQUENCY OSCILLATION VENTILATION:

High frequency mechanical ventilation is indicated in those with worsening condition, significant air leak, those with restrictive disease, with an oxygenation index >13. The main advantage is optimising ventilation and oxygenation with lower risk of pulmonary injury induced by mechanical ventilation.[10]

NONINVASIVE POSITIVE-PRESSURE VENTILATION:

Noninvasive positive-pressure ventilation keeps airways open, improves respiratory flow, maintains functional residual capacity, improves pulmonary compliance, facilitates secretion mobilisation, reduces work of breathing, improves gas exchange and preserves surfactant synthesis and release. This therapy is used for those children with apnoeic episodes and hence prevents the use of invasive ventilation.[10]

PROPHYLAXIS IMMUNOGLOBULINS AND MONOCLONAL ANTIBODIES:

Palivizumab, a humanised monoclonal IgG1 antibody specifically directed to the RSV fusion protein, has been shown to be efficacious in preventing serious RSV disease in high risk patients.[5] AAP recommends palivizumab prophylaxis to be given to selected infants and children with chronic lung disease or a history of prematurity (less than 35 weeks' gestation) or with congenital heart disease.[3]

A recent Cochrane systematic review assessing immunoglobulin treatment of RSV infection rather than its role as a prophylactic measure identified four RCTs of which none demonstrated a statistically significant benefit.[17]

METHODOLOGY

SOURCE OF DATA:

Children in the age group of 2 months to 2 years with bronchiolitis admitted in the Pediatrics ward, Government Mohan Kumaramangalam Medical College Hospital,salem.

TYPE OF STUDY:

Hospital based prospective interventional double blinded randomized trial.

INCLUSION CRITERIA:

All cases of acute bronchiolitis with a Respiratory Distress Assessment Instrument (RDAI) score of 4 to 15 [on a scale of 0 (mild) to 17 (severe)].

EXCLUSION CRITERIA:

The following children were excluded from the study-

- Who received oral or inhaled corticosteroids during the preceding 2 weeks Who have had a previous episode of wheezing
- Who have a known chronic cardiopulmonary disease
- Who are immunodeficient

- Who have had exposure to varicella within the preceding 3 weeks

- Who present with severe respiratory distress (pulse > 200/min, respiratory rate > 80/min, or RDAI score above 15) or profound lethargy/ altered sensorium .

- Children who showed evidence of SIRS or culture proven sepsis.

- Who are preterms with corrected age of less than 4 weeks at presentation

- Whose parents have not given consent

METHODS OF COLLECTION OF DATA:

The study was a hospital based prospective interventional double blinded randomized trial .The Study period was from july 2015 to june 2016. Consent was taken from the parents of all the children included in the study. Random numbers were assigned by the statistician for all patients.The three drugs were labelled as A,B and C from the pharmacy and the drug was distributed to the patients as per the random number by the ward duty medical officer. The drugs were not disclosed to me till the end.

SAMPLE SIZE:

The study population was 90 .The children who were absconded from ward, who went AMA and whose parents did not give consent were excluded from the study.

DIAGNOSIS:

Diagnosis of acute bronchiolitis is mainly clinical, based on the presence of, nasal discharge, wheezy cough, fine inspiratory crackles and/or high pitched expiratory wheeze.

- Cases were studied with reference to clinical history, physical findings, chest x-ray, total leucocyte count and differential count.

- On admission, SpO2 was recorded in all patients.

- RR, HR, axillary temperature and SpO2 were measured at admission and monitored initially half hourly for 2 hours, hourly for 4hours then every 6th houry.

MONITORING:

Monitoring was done by measuring the oxygen saturation with pulse-oximeter and the clinical status including the RDAI score, every 30 min for the first 2 hours, every hourly for the next 4 hours and then every 6th hourly during the hospital stay. However, based on the child's condition the frequency of monitoring was increased if necessary.

INVESTIGATIONS:

Total leucocyte count, differential count, chest x-ray, urine routine and urine culture and sensitivity were done in all patients.

The following age specific values for heart rate, respiratory rate and leucocyte count were considered normal:

TABLE 2: AGE SPECIFIC VALUES

AGE GROUP	HEART RATE(BEATS /MIN)	RESPIRATORY RATE(BEATS /MIN)
0 day – 3 months	100-150	35-55
3-6 months	90-120	30-45
6-12 months	80-120	25-40
1-2 year	70-110	20-30

TREATMENT:

Supportive treatment like supplemental oxygen, intravenous fluids and antipyretics were given to all the children. The study subjects were included into one of the 3 interventional groups through randomisation:

GROUP A: Given nebulisation with drug A

GROUP B: Given nebulisation with drug B

GROUP C: Given nebulisation with drug C

PROCEDURE

The dosages of medications used were:

- Nebulised adrenaline 3 ml in 1:1000 solution per treatment every 6 th hourly
- Nebulised salbutamol (0.15 mg /kg/dose) with 3 ml saline, per treatment every 6 th houly
- Nebulised budesonide 500 mcg in 3 ml saline per treatment every 8^{th} hourly

The drugs A,B, C were not known till the end of the study.

RESULTS

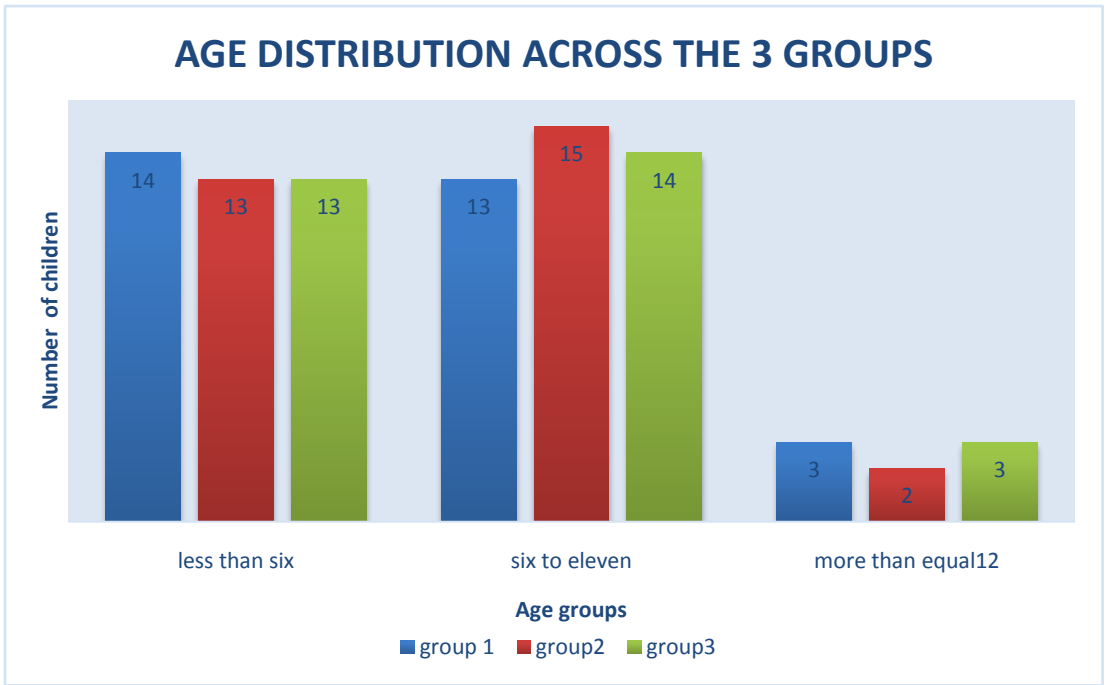
The study population was 90.Those children who went AMA who were absconded and whose parents who have not given consent were excluded from the study. They were divided into 3 groups each of 30.Group A was given drug A , group B was given drug B and group C was given drug C. Drugs A ,B and C were not disclosed.

1)AGE DISTRIBUTION

TABLE 3:DISTRIBUTION OF CHILDREN ACCORDING TO AGE

Group	Age in months						Total
	2- 6		6 - 11		12-24		
	N	%	N	%	N	%	
Group A	14	47	13	43	3	10	30
Group B	13	43	15	50	2	7	30
Group C	13	43	14	47	3	10	30
Total	40	44.4	42	46.7	8	8.9	90

GRAPH 1:

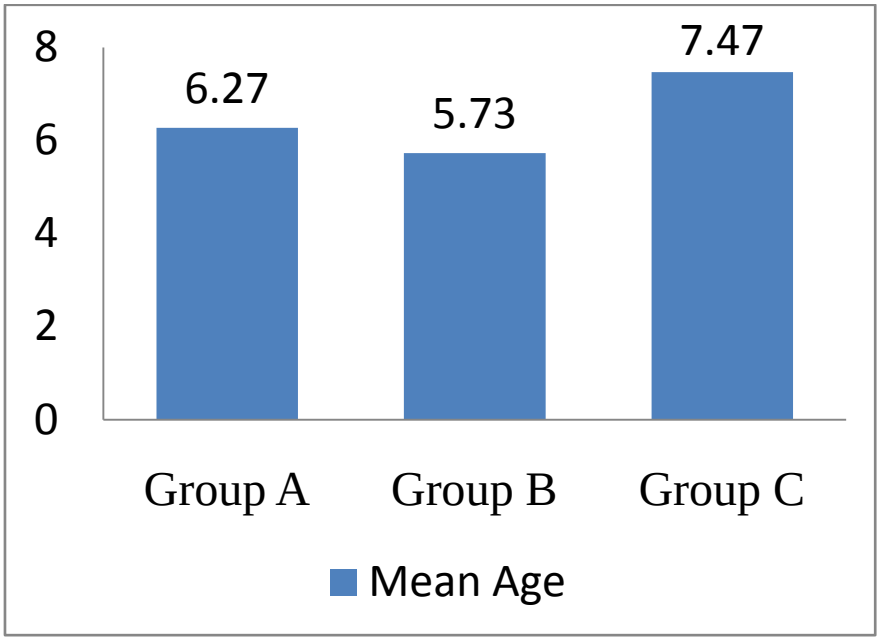


In the above table, in group A , 14,(47%) of children were between 2-6 months,13,(43%) between 6-11 months and 3(10%) between 12-24 months. In group B ,13(43%) of children were between 2-6 months 15(50%) between 6-12 months and 2(7%) between 12-24 months. In group C ,13(43%) of children were 2-6 months,14(47%) between 6-11 months and 3(10%) between 12-24 months.

TABLE 4:MEAN AGE OF CHILDREN

		Age			
Group	**N**	**Mean**	**SD**	**ANOVA**	**P**
Group A	30	6.27	3.79	.026	0.974
Group B	30	5.73	3.25		
Group C	30	7.47	3.76		
Total	90	6.49	3.64		

GRAPH 2:MEAN AGE OF CHILDREN



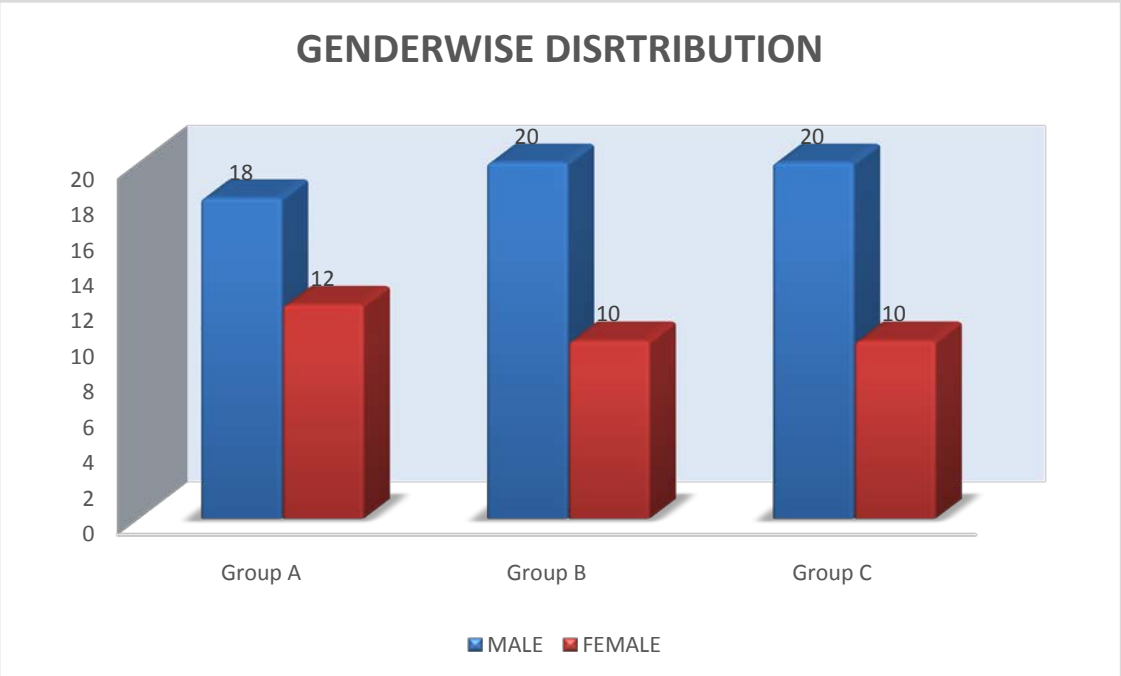
In the above table, the mean age of presentation in Group A was 6 .27 months, in Group B was 5.73 months while in Group C it was 7.47 months. There was no significant difference in the mean age of presentation between the 3 groups. (p=0.57 between Group 1 and 2, p=0.07 between Group 2 and 3, p=0.20 between Group 3 and 1) and the majority of cases were between 6-11 months.

GENDER DISTRIBUTION

TABLE 5:DISTRIBUTION OF CHILDREN ACCORDING TO GENDER

Group	Sex				Total	p value
	Male		Female			
	N	%	N	%		
Group A	18	60	12	40	30	0.829
Group B	20	67	10	33	30	
Group C	20	67	10	33	30	
Total	58	64	32	36	90	

GRAPH 3:

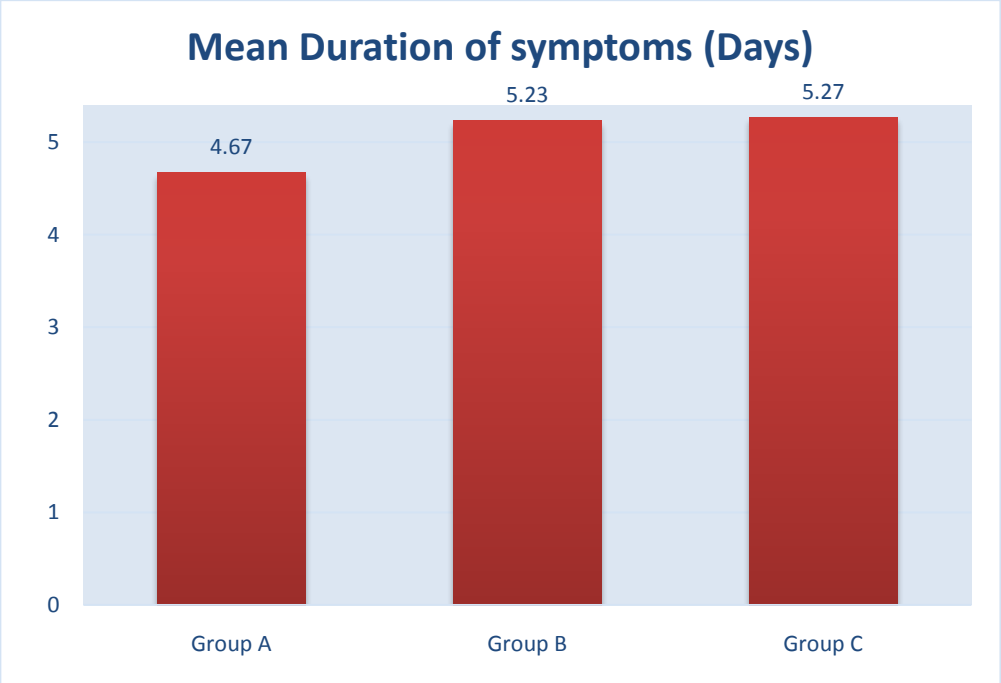


Out of 30 cases in Group A, 18 (60%) were males and 12 (40%) were females. In Group B, 20 (67%) were males and 10(33%) were females. In Group C, 20(67%) were males and 10(33%) were females. In total, there were 58 (64%) males and 32 (36%) were females. The difference in the proportion of males to females was not statistically significant. However, the ratio between males and female was 1.8.

TABLE 6:DURATION OF SYMPTOMS

		Duration of symptoms (Days)			
	N	Mean	SD	ANOVA	P
Group A	30	4.67	2.50	0.452	0.638
Group B	30	5.23	3.34		
Group C	30	5.27	2.29		
Total	90	5.06	2.73		

GRAPH 4: MEAN DURATION OF SYMPTOMS



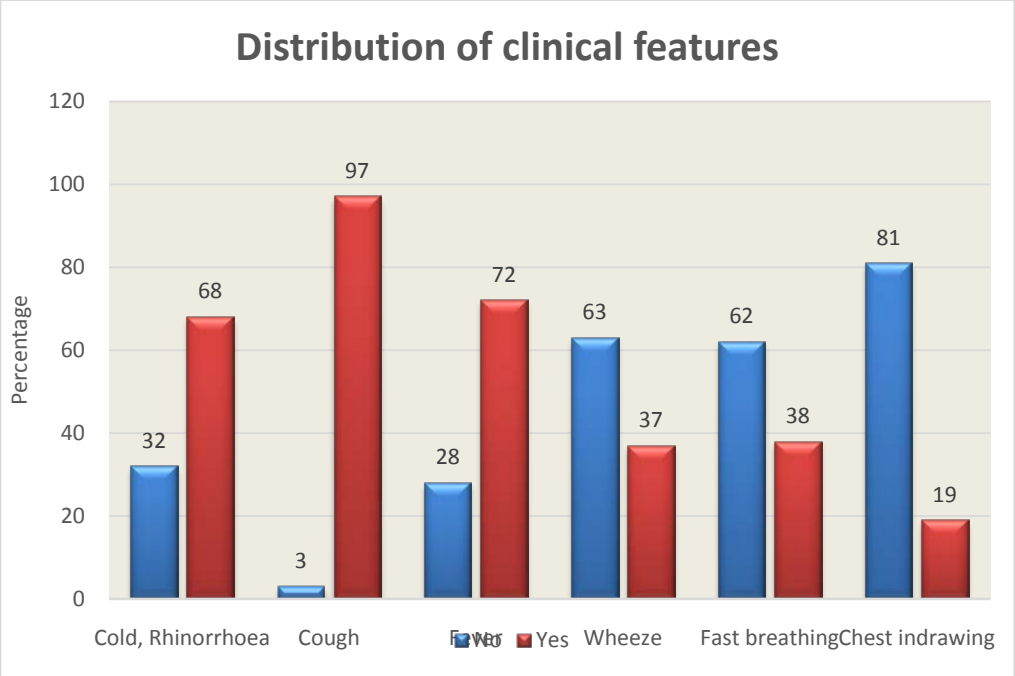
In our study, Group A had mean duration of symptoms of 4.6 days, Group B had 5.23 days and Group C had 5.27 days. p value -0.6. Hence there was no significant difference between the 3 groups.

The bar chart above shows the mean duration of symptoms which are highest for the Group C(5.27) followed by Group B(5.23) and Group A.(4.67). p value is 0.638.Hence no significant decrease between the 3 groups.

TABLE 7:CLINICAL FEATURES

SYMPTOM/CLINICAL FEATURE	No		Yes		Total
	N	%	N	%	
Cold, Rhinorrhoea	29	32	61	68	90
Cough	3	3	87	97	90
Fever	25	28	65	72	90
Wheeze	57	63	33	37	90
Fast breathing	56	62	34	38	90
Chest indrawing	73	81	17	19	90

GRAPH 5:

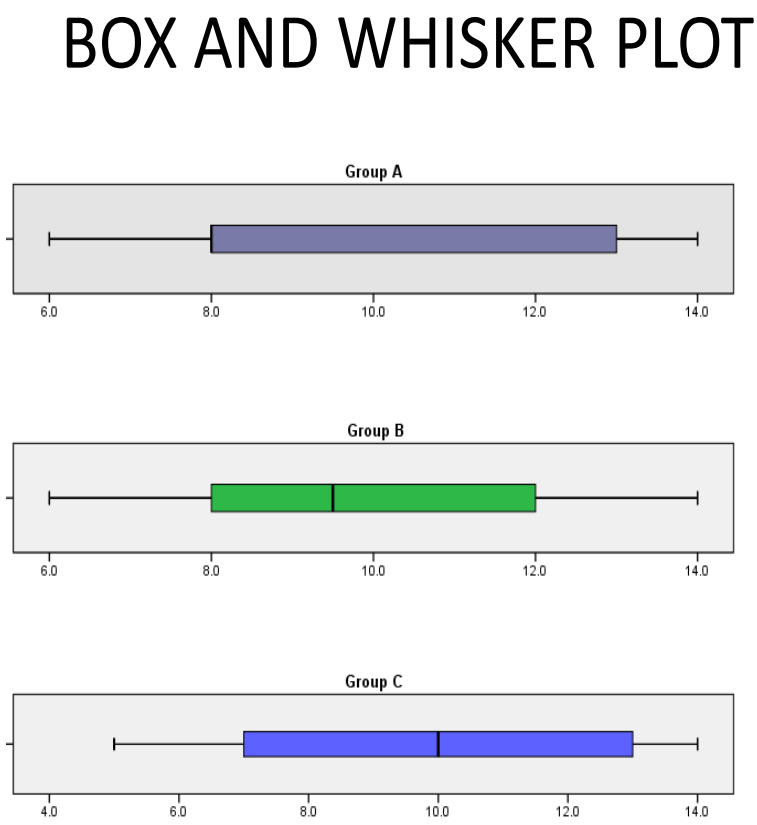


In our study cough was the most common presenting complaint seen in 87 (97%), followed by fever which was complained by 65 (72%), cold and rhinorrhoea in 61 (68%) and wheeze was present in 33 (37%). While fast breathing was present in 34 (38%), chest indrawing was present in 17 (19%) and feeding difficulty was seen in 7 (8%).

TABLE 8:RDAI SCORES (on admission)

	MEAN RDAI SCORING	SD
GROUP A	9.73	2.82
GROUP B	9.77	2.39
GROUP C	9.87	3.28

GRAPH 6:



Box and Whisker Plot of RDAI Scores of 3 Groups

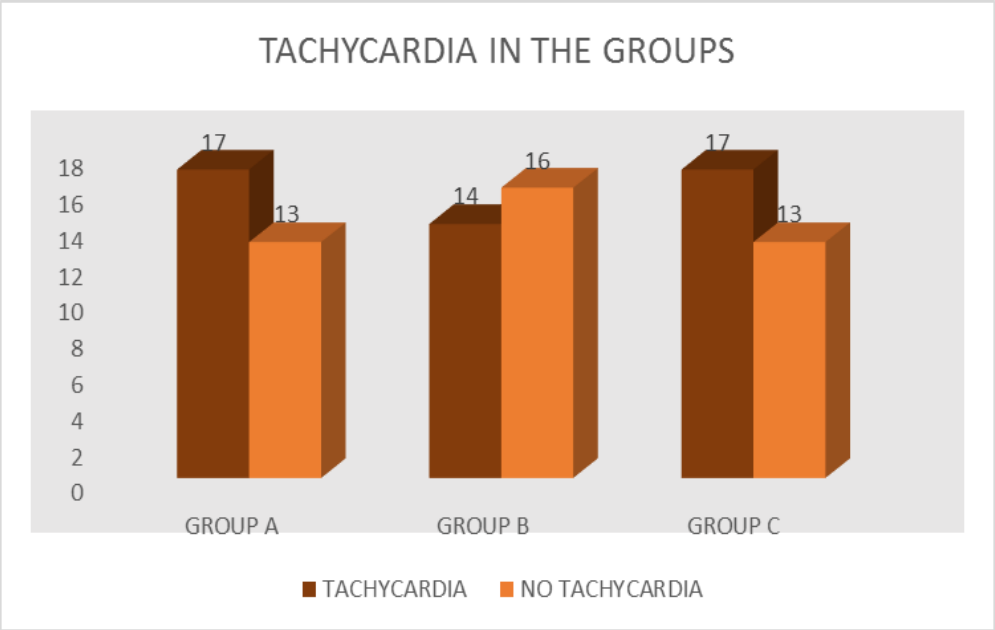
The table above shows the mean RDAI scores on admission for the three groups with mean RDAI scoring for group A being 9.73 and group B being 9.77 and group C being 9.87. The SDs are 2.82,2.39,3.28 respectively for the 3 groups

In this study, after applying Mann-Whitney-U test when RDAI scores of Group A was compared to that of Group B, there was no significant difference between the two Groups (p=0.16). Similarly when Group B and Group C were compared, there was no significance (p=0.47). There was no significant difference between C and A as well (p=0.52).

TABLE 9: CHILDREN WIYH TACHYCARDIA (AT ADMISSION)

	TACHYCARDIA	NO TACHYCARDIA
GROUP A	17(57)	13(43%)
GROUP B	14(47%)	16(53%)
GROUP C	17(57%)	13(43%)

GRAPH 7:



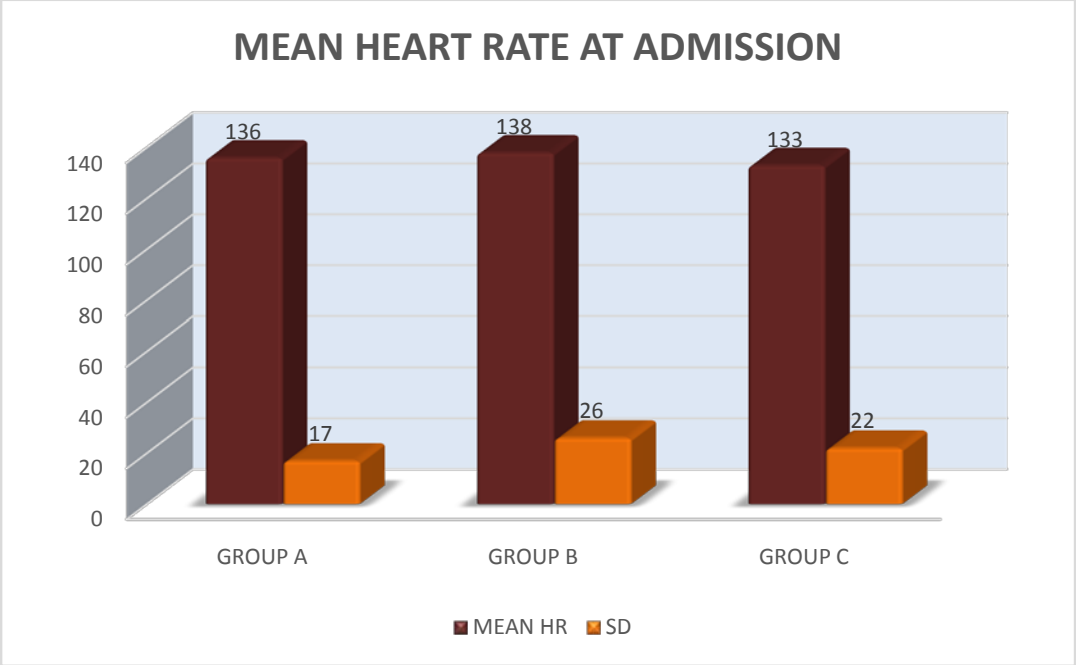
Among the children in group A, 17(57%) of them had achycardia, in Group B 14(47%) of them had tachycardia and in group C 17(57%) of them had tachycardia. There was no significant difference between the groups (p value 0.61)

TABLE 10:

MEAN HEART RATE OF CHILDREN IN THREE GROUPS

	MEAN HR (/min)	SD
GROUP A	136	17
GROUP B	138	26
GROUP C	133	22

GRAPH 8:

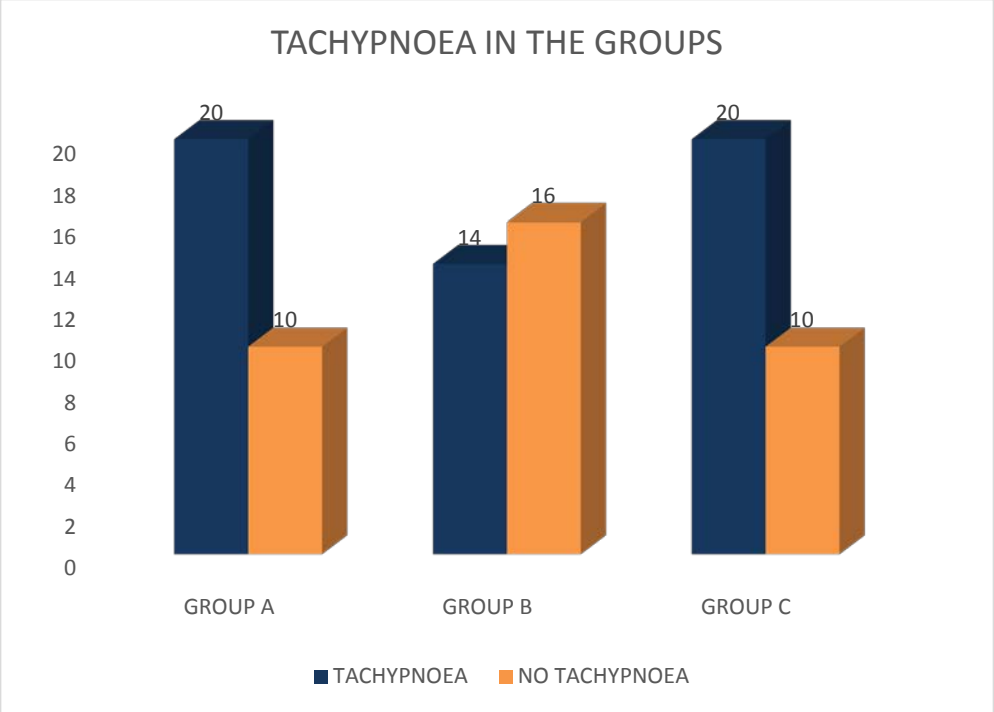


The mean heart rate was 136 for Group A, 138 for Group B and 133 for group C with a standard deviation of 26, 17 and 22 respectively. There was no significant difference between the groups (p value 0.61)

TABLE 11:CHILDREN WITH TACHYPNOEA

	TACHYPNOEA(/MIN)	NO TACHYPNOEA
GROUP A	20(67%)	10(33%)
GROUP B	14(47%)	16(53%)
GROUP C	20(67%)	10(33%)
TOTAL	54(60%)	36(40%)

GRAPH 9:

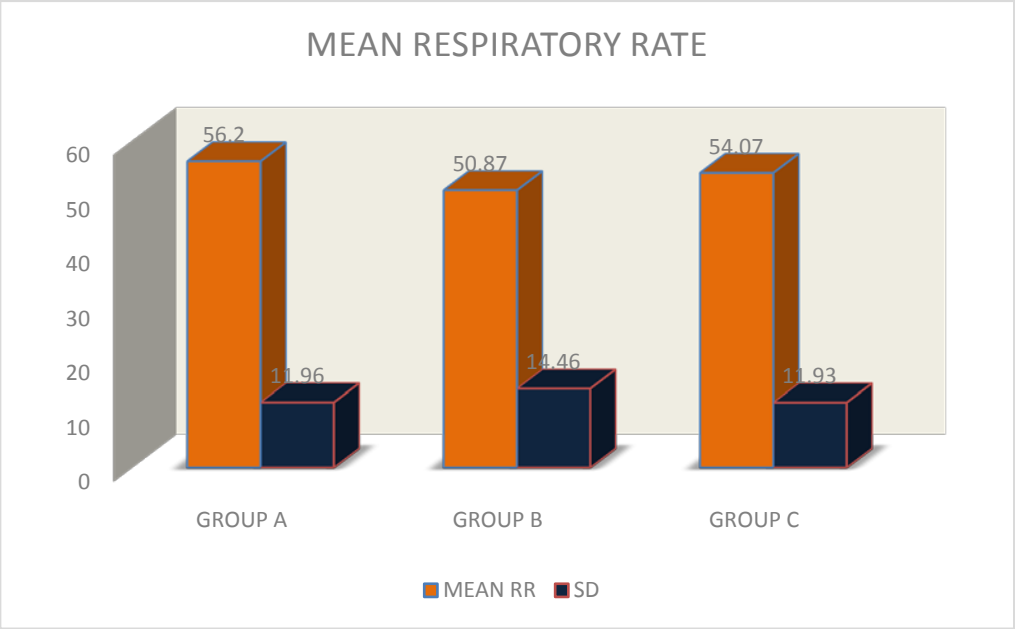


In the above table,in group A,20(67%) had tachypnoea,in group B 14(47%) had tachypnoea, and in group C,20(67%) had tachypnoea.there was no significant difference among the groups.

TABLE 12) MEAN RESPIRATORY RATE

	MEAN RR	SD
GROUP A	56.20	11.96
GROUP B	50.87	14.46
GROUP C	54.07	11.93

GRAPH 10:



The mean respiratory rate for group A was 56.20., group B was 50.87 and for group C 54.07. There was no significant difference between the 3 groups (p value 0 .71)

TABLE 13: SPO2 IN CHILDREN AT ADMISSION

Group	SpO2-RA_Initial				Total	Chi square	p
	Up to 94		Above 94				
	N	%	N	%			
Group A	8	27	22	73	30	1.73	0.42
Group B	7	23	23	77	30		
Group C	4	13	26	87	30		
Total	22	24	68	76	90		

In GroupA, 8 (27%) had SpO2 < 94%, other 22 (73%) maintained more than > 94%. Group B, 7 (23%) had SpO2 < 94%, 23 (77%) had SpO2 > 94%. In Group C, 4 (13%) had SpO2 < 94%, 26 (87%) maintained saturation at room air.There was no significant difference between the groups .p value 0.42

TABLE 14) Mean SPO2 among three groups

	Mean SPO2	SD
GROUP A	95.10	3.9
GROUP B	94.40	5.76
GROUP C	95.27	2.18

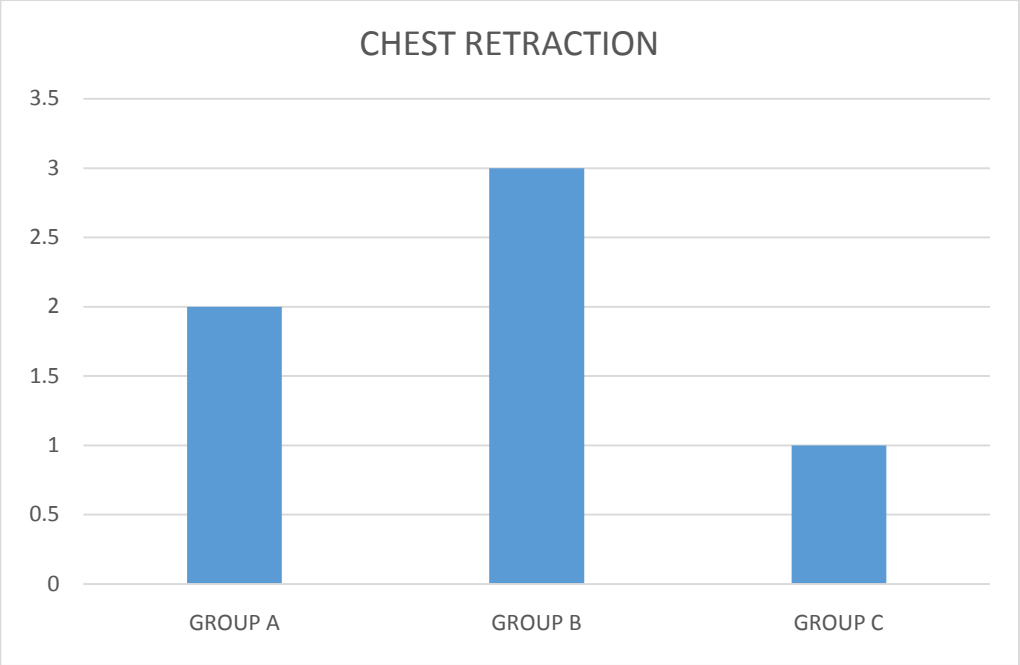
GRAPH 11:

From the above table the mean SPO2 in group A is 95.10 with a standard deviation of 3.9, in group B the mean SPO2 is 94.40 with a standard deviation of 5.76 and the mean SPO2 in group C is 95.27 with a standard deviation of 2.18. There is no significant difference between the mean SPO2 of the three groups at admission.

TABLE 15: CHILDREN WITH RETRACTIONS

Group	Retractions				Total	Chi square	p value
	No		Yes				
	N	%	N	%			
Group A	2	7	28	93	30	1.07	0.585
Group B	3	10	27	90	30		
Group C	1	3	29	97	30		
Total	6	7	84	93	90		

GRAPH 12:



According to the above table, in Group A while 2 (7%) did not have retractions, all the remaining 28 (93%) did have retractions. In Group B, only 3 (10%) had no retractions, all the other 27(90%) had retractions. In Group C, 1 (3%) had no retractions whereas 29(907%) had retractions. p value was 0.585. The difference in the above proportion was not statistically significant.

TABLE 16: NUMBER OF CHILDREN WITH RHONCHI

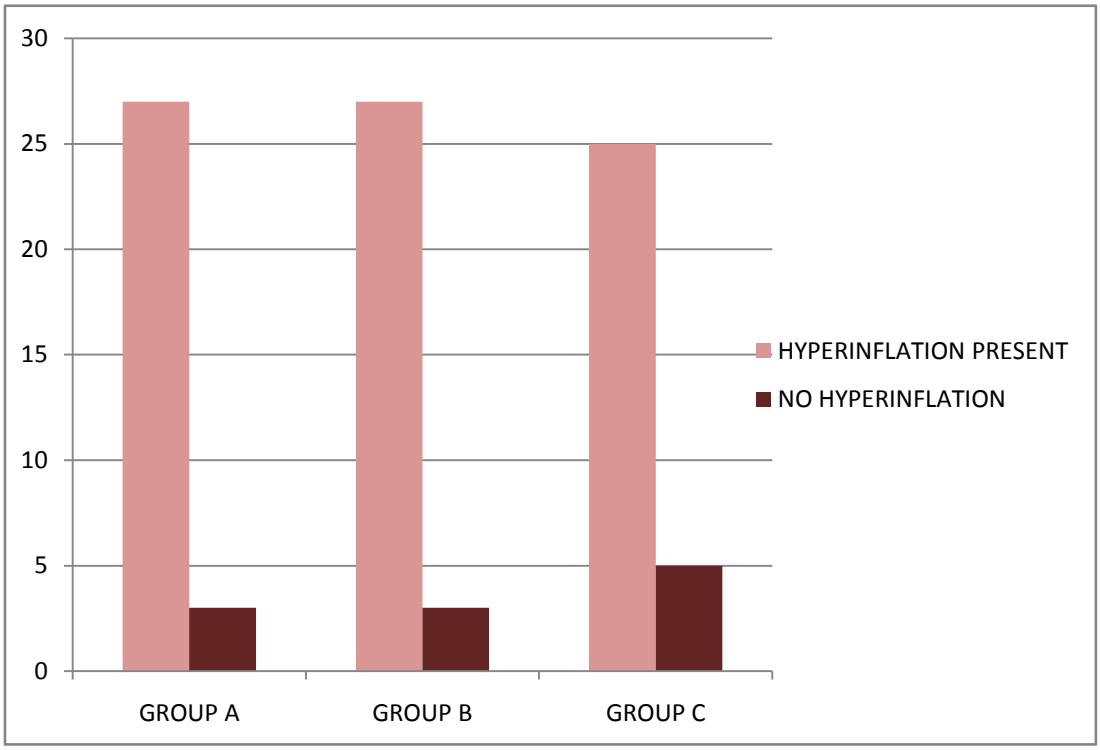
Group	Rhonchi				Total
	Yes		No		
	N	%	N	%	
Group A	30	100	0	0	30
Group B	30	100	0	0	30
Group C	30	100	0	0	30
Total	90	100	0	0	90

In children with rhonchi, in Group A, all 30 (100%) had rhonchi, In Group B all 100% had some rhonchi. Also in Group C, all 30(100%) had rhonchi .

TABLE 17: CHILDREN WITH HYPERINFLATION

Group	CXR				Total	Chi square	p
	Hyperinflation		No hyperinflation				
	N	%	N	%			
Group A	27	90	3	10	30	1.73	0.421
Group B	27	90	3	10	30		
Group C	24	80	6	20	30		
Total	78	87	12	13	90		

GRAPH 13



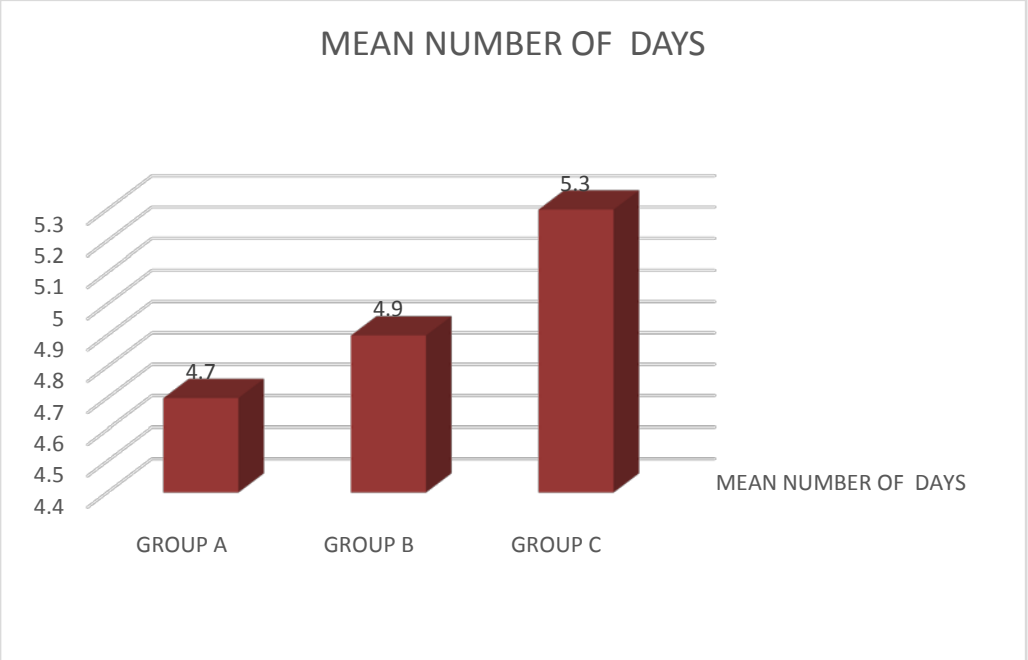
According to above table, 27 (90%) had hyperinflation on chest X-ray, while 3 (10%) did not have. In group B, 27 (90%) had hyperinflation on chest X-ray and 3 (10%) did not have. In group C, 24 (80%) had hyperinflation and 6 (20%) did not have. P value is 0.421.Hence not statistically significant.

DURATION OF STAY AMONG THE GROUPS

TABLE 18:

	MEAN NUMBER OF DAYS	SD
GROUP A	4.7	1.6
GROUP B	4.9	3.1
GROUP C	5.3	3.4

GRAPH 14



In our study, mean duration of stay in Group A was 4.7±1.6 days, in Group B, mean duration of stay of patients was 4.9 ± 3.1 days and Group C, mean duration was 5.3±3.4 days. There was no significant difference between the 3 groups.(P value 0.68)

OUTCOMES

TABLE 19:MEAN VALUES AT ADMISSION

	MEAN RDAI	SD	MEAN HR	SD	MEAN RR	SD	MEAN SPO2	SD
Group A	9.73	2.82	135.53	17.2	56.20	11.96	95.10	3.9
Group B	9.77	2.39	138.16	25.7	50.87	14.46	94.40	5.76
Group C	9.87	3.28	133.80	21.7	54.07	11.93	95.27	2.18

TABLE 20:

OUTCOME AFTER 24 HRS OF ADMISSION

	MEAN HR	SD	MEAN RR	SD	MEAN SPO2	SD	Mean RDAI	SD
GROUP A	129.23	18.86	45.67	11.50	96.93	2.05	6.9	2.51
GROUP B	119.20	10.23	39.33	8.76	95.77	4.68	5.3	1.69
GROUP C	124.53	15.81	44.60	9.62	96.8	1.54	6.2	2.83

In the above table ,after 24 hrs,in group A , the mean heart rate was 129.23,the mean RR was 45.67 ,mean RDAI was 6.9 and the mean spo2 was 96.93. In group B the mean HR was 119.20,mean RR was 39.30 ,mean RDAI was 5.3 and mean spo2 was 96.93. In group C ,the mean HR was 124.53, mean RR was 44.60 ,mean RDAI was 6.2 and mean spo2 was 96.8.

From the above table comparing the outcomes after 24 hrs of admission there is a decrease in mean HR, mean RR, mean RDAI and improvement in mean saturation. Among all 3 groups and it is to be noted that marked improvement is shown in Group B in terms of all the four variables.

TABLE 21: OUTCOME AFTER 72 HRS

	MEAN HR	**SD**	**MEAN RR**	**SD**	**MEAN SPO2**	**SD**	**MEAN RDAI**	**SD**
GROUP A	117.57	6.70	38.00	10.43	97.27	2.75	2.83	2.98
GROUP B	117.37	10.96	36.17	5.65	97.37	2.65	1.10	1.45
GROUP C	123.20	12.19	41.50	8.27	97.1	2.78	2.30	2.97

In the above table , after 72 hrs ,in group A , the mean heart rate was 117.57 ,the mean RR was 38 ,mean RDAI was 2.83 and the mean spo2 was 97.27. In group B the mean HR was 117.37.mean RR was 36.17, mean RDAI was 1.45 and mean spo2 was 97.37.In group C ,the mean HR was 123.20, mean RR was 41.50 ,mean RDAI was 2.30 and mean spo2 was 97.1.

From the above table comparing the outcomes after 72 hrs of admission the mean HR, mean RR, and mean RDAI have shown improvement in all 3 groups and it is to be noted that marked improvement is shown in Group B in terms of all the four variables.

TABLE 22:

COMPARISON BETWEEN ADMISSION AND 24 HOURS

	MEAN HR AT ADMISSION	**SD**	**AFTER 24 HRS**	**SD**	**MEAN RR**	**SD**	**AFTER 24 HRS**	**SD**	**MEAN SPO2**	**SD**	**AFTER 24 HRS**	**SD**
Group A	135.53	17.17	129.23	18.86	56.20	11.96	45.67	11.50	95.10	1.24	96.93	2.05
GROUP B	138.16	25.71	119.20	10.23	50.87	14.46	39.33	8.76	94..40	1.67	95.77	4.68
GROUP C	133.80	21.68	124.53	15.81	54.07	11.93	44.60	9.62	95.27	0.91	96.8	1.54

After applying t test to the above table at 24 hrs, there was significant difference between the groups with respect to means of HR,

RR ,RDAI and spo2 . There was significant reduction in HR,RR, RDAI and spo2 in group B when compared to group A and C

TABLE 23:

COMPARISON BETWEEN ADMISSION AND 72 HOURS

	MEAN HR	SD	AFTER 72 HRS	SD	MEAN RR	SD	AFTER 72 HRS	SD	MEAN SPO2	SD	AFTER 72 HRS	SD
GROUP A	135.53	17.17	117.57	6.70	56.20	11.96	38.00	10.43	95.10	1.24	97.27	2.75
GROUP B	138.16	25.71	117.37	10.96	50.87	14.46	36.17	5.65	94.40	1.67	97.37	2.65
GROUP C	133.80	21.68	123.20	12.19	54.07	11.93	41.50	8.27	95.27	0.91	97.1	2.78

After applying t test to the above table at 72 hrs, there is significant decrease in RDAI score in group B in comparison to Groups A and C.($p = 0.015$) ,($p = 0.011$) ,($p = 0.04$). Similarly there is significant decrease in HR, and RR in group B in comparison with groups A and C.($p < 0.05$)

Henceforth our study has shown that there is statistical significance in the improvement in heart rate, respiratory rate, and RDAI at 24 hrs and 72 hrs in Group B in comparison with groups A and C

which has been depicted in the tables given below for individual variables.The improvement in saturation is not significant at 72 hrs.The spo2 level has increased in group B at 24 hrs and 72 hrs when compared to admission ,but statistically the difference is significant at 24 hrs but not in 72 hrs.

TABLE 24:

COMPARISON TABLE FOR RDAI

		N	Mean	SD	ANOVA	P
RDAI_Initial	Group A	30	9.73	2.82	0.018	0.982
	Group B	30	9.77	2.39		
	Group C	30	9.87	3.28		
	Total	90	9.79	2.82		
RDAI_24 hrs	Group A	30	6.90	2.51	3.114	0.049 *
	Group B	30	5.37	1.69		
	Group C	30	6.27	2.83		
	Total	90	6.18	2.45		
RDAI_72 hrs	Group A	30	2.83	2.98	3.576	0.032 *
	Group B	30	1.10	1.45		
	Group C	30	2.30	2.97		
	Total	90	2.08	2.65		

The RDAI of the 3 groups are compared at 24 hrs and 72 hrs using anova and was found to have significant improvement and hence there was statistical difference.

There is significant decrease in RDAI score at 24 hrs and 72 hrs in group B in comparison to Group A.($p < 0.05$)

TABLE 25:

COMPARISON TABLE OF HEART RATE

		N	Mean	SD	ANOVA	P
HR_Initial	Group A	30	135.53	17.17	0.31	0.738
	Group B	30	138.16	25.71		
	Group C	30	133.80	21.68		
	Total	90	135.83	21.63		
HR_24 hrs	Group A	30	129.23	18.86	3.19	0.046*
	Group B	30	119.20	10.23		
	Group C	30	124.53	15.81		
	Total	90	124.53	15.76		
HR_72 hrs	Group A	30	117.57	6.70	3.15	0.048*
	Group B	30	117.37	10.96		
	Group C	30	123.20	12.19		
	Total	90	119.38	10.47		

*Significant at 5 %

There is significant Decrease in HR at 24 hrs and 72 hrs in group B in comparison to Group A.($p < 0.05$)

TABLE 26:

COMPARISON TABLE OF RESPIRATORY RATE

		N	Mean	SD	ANOVA	P
RR_Initial	Group A	30	56.20	11.96	1.02	0.364
	Group B	30	50.87	14.46		
	Group C	30	54.07	11.93		
	Total	90	53.71	12.66		
RR_24 hrs	Group A	30	45.67	11.50	3.43	0.037*
	Group B	30	39.33	8.76		
	Group C	30	44.60	9.62		
	Total	90	43.20	10.29		
RR_72 hrs	Group A	30	38.00	10.43	3.16	0.047*
	Group B	30	36.17	5.65		
	Group C	30	41.50	8.27		
	Total	90	38.56	8.55		

Significant at 5%.The respiratory rates between the groups A ,B,and C were compared .There was marked decrease in RR in group B when compared to group A and group C.P value (0.037) at 24 hrs and 0.047 at 72 hrs.

TABLE 27:

COMPARISON TABLE OF SPO2

		N	Mean	SD	ANOVA	P
SPO_2_Initial	Group A	30	95.10	3.91	1.563	0.215
	Group B	30	94.40	5.76		
	Group C	30	96.30	2.18		
	Total	90	95.27	4.24		
SPO_2_24 hrs	Group A	30	96.43	2.14	5.242	0.007*
	Group B	30	95.30	4.52		
	Group C	30	97.77	1.07		
	Total	90	96.50	3.09		
SPO_2_72 hrs	Group A	30	96.57	3.62	1.964	0.146
	Group B	30	97.23	2.60		
	Group C	30	97.93	1.26		
	Total	90	97.24	2.70		

From this table it is evident that spo2 levels has shown improvement after 24 hrs and 72 hrs in groups A,B, C and in particular ,there is statistical difference p value(<0.005), for mean spo2 level after 24 hrs among the 3 groups.

TABLE 28: COMPARISON OF VARIABLES ACROSS THREE AGEGROUPS IN GROUP A

VARIABLE	0 TO 6 MONTHS		6-12 MONTHS		>= 12 MONTHS		P VALUE
	MEAN	SD	MEAN	SD	MEAN	SD	
HR ADMISSION	137.5	17.54	134.53	17.50	130.67	19.21	0.803
HR 24 HRS	133.143	21.01	128.07	17.59	116	6.92	0.257
HR 72 HRS	118.929	6.67	117.38	7.08	112	1.1	0.273
RR ADMISSION	59.0	10.77	53.38	14.10	53.33	4.1	0.487
RR 24 HRS	45.286	9.56	45.84	12.99	46.66	17.47	0.981
RR 72 HRS	36.429	9.15	37.38	6.70	48.0	24.33	0.285
SPO2 ADMISSON	97.714	1.38	94.84	3.89	95.33	3.05	0.746
SPO2 24 HRS	96.643	2.40	97.53	1.39	95.66	2.51	0.287
SPO2 72 HRS	96.286	3.86	97.76	1.16	97.33	1.15	0.665
RDAIADMISSION	10.571	2.76	8.92	2.53	9.33	4.16	0.12
RDAI 24 HRS	8.429	2.59	5.61	1.60	5.33	1.15	0.98
RDAI 72 HRS	4.286	3.49	1.03	1.79	2.66	0.5	0.54

In the above table the four outcome variables Heart rate, respiratory rate, spo2 and RDAI scores are compared within group A between three different age categories 0-6 months , 6-12 months and >= 12 months. It is observed from the table that heart rate has shown a decrease , the respiratory rate has reduced, the spo2 levels has increased and the RDAI scores has decreased when compared to admission levels at 24 hrs and 72 hrs for all the three age groups. The table also shows that there is no statistical significance between the outcome variables among the the three age groups of Group A implying that the action of the drug used in group A is almost similar in action in all the three age groups.

TABLE 29:

COMPARISON OF VARIABLES ACROSS THREE AGEGROUPS IN GROUP B

VARIABLE	0 TO 6 MONTHS		6-12 MONTHS		>= 12 MONTHS		P VALUE
	MEAN	SD	MEAN	SD	MEAN	SD	
HR ADMISSION	142.6	25.53	137.8	26.31	112.0	5.65	0.302
HR 24 HRS	122.0	11.32	115.2	6.73	131.1	15.55	0.064
HR 72 HRS	118.7	5.51	118.6	13.76	103.2	4.24	0.158
RR ADMISSION	46.23	8.85	53.66	15.59	70.25	14.14	0.062
RR 24 HRS	37.38	6.60	40.13	10.29	46.35	8.48	0.396
RR 72 HRS	37.23	5.74	34.33	5.21	43.15	1.14	0.079
SPO2 ADMISSON	95.30	6.21	95.66	2.43	94.36	5.65	0.443
SPO2 24 HRS	94.23	4.27	96.26	5.32	97.58	0.70	0.888
SPO2 72 HRS	97.61	1.70	97.0	3.40	98.50	0.74	0.664
RDAIADMISSION	9.92	2.95	9.8	2.01	8.5	0.71	0.695
RDAI 24 HRS	5.15	1.40	5.6	1.98	4.5	0.79	0.384
RDAI 72 HRS	0.92	1.44	1.40	1.50	1.0	1.2	0.325

In the above table the four outcome variables Heart rate, respiratory rate, spo2 and RDAI scores are compared within group B between three different age categories 0-6 months , 6-12 months and >= 12 months. It is observed from the table that the mean heart rate has decreased, the respiratory rate has decreased, the spo2 levels has

increased and the RDAI score has decreased when compared to admission levels and the levels at 24 hrs and 72 hrs for all the three age groups. **In comparison with the other groups (group A and Group B), group B has shown marked improvement with regard to the outcome variables in the current study**. The table also shows that there is no statistical significance between the outcome variables among the the three age groups of Group B implying that the action of the drug used in Group B is almost similar in action in all the three age groups.

TABLE 30:

COMPARISON OF VARIABLES ACROSS THREE AGEGROUPS IN GROUP C

VARIABLE	0 TO 6 MONTHS		6-12 MONTHS		>= 12 MONTHS		P VALUE
	MEAN	SD	MEAN	SD	MEAN	SD	
HR ADMISSION	142.6	25.53	137.8	26.31	112.0	5.65	0.302
HR 24 HRS	122.0	11.32	115.2	6.73	131.1	15.55	0.064
HR 72 HRS	118.7	5.51	118.6	13.76	103.2	4.24	0.158
RR ADMISSION	46.23	8.85	53.66	15.59	70.25	14.14	0.062
RR 24 HRS	37.38	6.60	40.13	10.29	46.35	8.48	0.396
RR 72 HRS	37.23	5.74	34.33	5.21	43.15	1.14	0.079
SPO2 ADMISSON	95.30	6.21	95.66	2.43	94.36	5.65	0.443
SPO2 24 HRS	94.23	4.27	96.26	5.32	97.58	0.70	0.888
SPO2 72 HRS	97.61	1.70	97.0	3.40	98.50	0.74	0.664
RDAIADMISSION	9.92	2.95	9.8	2.01	8.5	0.71	0.695
RDAI 24 HRS	5.15	1.40	5.6	1.98	4.5	0.79	0.384
RDAI 72 HRS	0.92	1.44	1.40	1.50	1.0	1.2	0.325

In the above table the four outcome variables ie Heart rate, respiratory rate, spo2 and RDAI scores are compared within group C between three different age categories 0-6 months , 6-12 months and >= 12 months. It is observed from the table that the mean heart rate has decreased, the respiratory rate has reduced, the spo2 levels(saturation) has increased and the RDAI scores has decreased when compared to admission levels and the levels at 24 hrs and 72 hrs for all the three age groups. The table also shows that there is no statistical significance between the outcome variables among the the three age groups of Group C implying that the action of the drug used in group C is almost similar in action all the three age groups.

DISCUSSION

AGE DISTRTIBUTION

The mean age of presentation in Group A was 6.7 months while in Group B was 5 months. In group C mean age of presentation was 7.6 months. This was comparable to other studies which showed peaking between 6-11 mnths.[1] AAP showed peak time of presentation as 7 months.[26]

GENDER DISTRIBUTION

In our study, out of 30 cases in Group A, 18 (60%) were males and 12 (40%) were females.

In Group B, 20 (67%) were males and 10 (33%) were females.

In Group 3, 20 (67%) were males and 10 (33%) were females.

In total, there were 58 (64%) males and 32 (36%) females. Male:female ratio was 1.8. This was similar to other studies which showed male preponderance.[26]

MEAN DURATION OF SYMPTOMS

In our study, Group A had mean duration of symptoms of 4.9 days, Group B had 5.23 days and Group C had 5.27 days. P value-0.638.there was no significant difference between the groups.This was

similar to other studies which showed mean duration of symptoms between 4-6 days .[1,11]

Comparison of clinical symptoms with other studies:

Symptoms	Present study	Kabir et al	Rasul CH et al
Cough	87(97%)	100%	56%
Cold /rhinorrhea	61(68%)	100%	NA
Fast breathing	34(38%)	NA	NA
Fever	65(72%)	NA	46%
Wheeze	33(37%)	NA	NA
Chest indrawing	17(19%)	NA	100%

The most common presenting complaint in our study was cough, which was present in 87 (97%) cases followed by fever in 65 (72%). This was followed by cold /rhinorrhoea which was present in 61(68%). Wheeze was present in 33(37%). This was followed by fast breathing in 34 (38%). These observations were similar to other studies.[52] except for chest indrawing which was present in only 17 (19%) in our study.

RDAI SCORES

The mean RDAI score in group A was 9.73,in group B was 9.77 and in group C was 9.87. Our study showed no significant difference in baseline RDAI scores between the Groups. After 24 hrs and 72 hrs ,there was significant reduction in the mean RDAI in all the 3 groups but the result was statistically significant in group B .p value 0.049 and 0.032 at 24 hrs and 72 hrs.

CHILDREN WITH TACHYCARDIA

Among the children in group A, 57% (17) of them had tachycardia, in Group B 47%(14%) of them had tachycardia and in group C 57%(17) of them had tachycardia. There was no significant difference between the groups (p value 0.61). After 24 hrs and 72 hrs ,there was significant reduction in the mean HR, in all the 3 groups but the was statistically significant only in group B. p value 0.046 and 0.048.

CHILDREN WITH TACHYPNOEA

In the study, in group A, 20 (67%) had tachypnoea and 10 (33%) did not have. In Group B, 14 (47%) had tachypnoea, 16 (53%) did not have tachypnoea. In Group C, 20(67%) had tachypnoea and 10 (33%) did not have.

p value-0.71.There was no significant difference between the 3 groups. After 24 hrs and 72 hrs ,there was significant reduction in the mean RR, in all the 3 groups but that was statistically significant only in group B. p value 0.037 and 0.047 for 24 hrs and 72 hrs respectively.

CHILDREN WITH SPO2<94%

In Group A, 8 (27%) had SpO2 < 94%, other 22 (73%) maintained more than > 94%.In Group B, 7 (23%) had SpO2 < 94%, 23 (77%) had SpO2 > 94%. In Group C, 4 (13%) had SpO2 < 94%, 26 (87%) maintained saturation >94% at room air.There was no significant baseline difference at admission.but after 24 hrs and there was improvement in saturation with significant difference in group B. p value 0.007.but the difference was not statistically significant after 72 hrs.

CHILDREN WITH RETRACTIONS

According to the above table, in Group A while 2 (7%) did not have retractions, all the remaining 28 (93%) did have retractions. In Group B, only 3 (10%) had no retractions, all the other 27(90%) had retractions. In Group C, 1 (3%) had no retractions whereas 29(907%) had retractions. . p value was 0.585. The difference in the above proportion was not statistically significant

CHILDREN WITH RHONCHI

In children with rhonchi, in Group 1A all 30 (100%) had rhonchi, In Group B all 100% had some rhonchi. Also in Group C, all 30(100%) had rhonchi .In our study, rhonchi was most common sign in all the 3 Groups, followed by tachypnoea and tachycardia. Retractions, crepitations and non-maintainance of saturation were present to lesser extent.All these findings correlated with the other studies like Rasul et al.

CHILDREN WITH HYPERINFLATION

In our study,27 (90%) had hyperinflation on chest X-ray, in group A,while 3 (10%) did not have. In group B, 27 (90%) had hyperinflation on chest X-ray and 3 (10%) did not have. In group C, 25 (83.3%) had hyperinflation and 5 (16.6%) did not have. P value is 0.421.Hence not statistically significant.

MEAN DURATION OF STAY

In our study, mean duration of stay in Group A was 4.7±1.6 days, in Group B, mean duration of stay of patients was 4.9 ± 3.1 days and Group C, mean duration was 5.3±3.4 days. This was similar to the other studies conducted.[13,26] . There was no significant difference between the 3 groups.(P value 0.68)

There is also no statistical significance between the outcome variables among the the three age groups of Group A,B and C implying that the action of the drugs used in group A,B and C, respectively is almost similar in action in all the three age groups.

The outcome of this study was assessed at 24 and 72 hrs after administration of the drugs A ,B ,C . When assessed after 24 hrs there was significant reduction in HR, RR and RDAI in all groups but there was marked improvement in group B when compared to groups A and C. There was improvement in saturation after 24 hrs in group B but that was not significant at 72 hrs. In Group B, there was decrease in tachypnoea, tachycardia, improvement in RDAI at 24 hrs and 72 hrs.The significance was more in Group B compared to other Groups.

So, overall there was significant decrease in HR, RR and RDAI in group B. There was clinical improvement in the children in group B and there was faster improvement and quick relief of symptoms .Hence, Group B showed significant improvement in decreasing tachycardia, tachypnoea and RDAI but there was not much change in spo2 among any group.

Finally the groups A, B and C were revealed. Drug A was found to be SALBUTAMOL, drug B was ADRENALINE and drug C was BUDESONIDE. There was no significant baseline difference between the Groups in terms of presence of tachypnoea,tachycardia,spo2 or RDAI scoring. After 24 hrs when the Groups were compared, there was significant reduction in HR, RR and ,RDAI in Adrenaline Group compared to others. So this is attributed to the effect of the drug B (ADRENALINE). Thus by all means, group B which is **NEBULISED ADRENALINE brought about rapid symptomatic improvement** compared to nebulised salbutamol and nebulised budesonide. Hence nebulised adrenaline can be initial choice for acute control of symptoms.

CONCLUSION

- All the 3 groups reduced the respiratory distress and hence showed clinical improvement. However, Group B that is use of nebulised adrenaline brought about symptomatic improvement in the decrease in tachycardia, tachypnoea , RDAI score and spo2 within 24 hrs and the difference was significant.

- Hence nebulised adrenaline can be the initial choice for acute control of symptoms

- Use of nebulised adrenaline, nebulised salbutamol and nebulised budesonide only however did not reduce the duration of stay in the hospital.

SUMMARY

Our study included a total of 90 cases, out of 30 cases in Group A, 18(60%) were males and 12(40%) were females. In Group B, 20 (67%) were males and 10 (33%) were females. In Group C, 20 (67%) were females and 10(33%) were females. In total, there were 58 (64%) males and 32 (36%) were females. Male:female ratio was 1.8 The most common presenting complaint in our study was cough which was present in 87 (97%) cases followed by fever in 65 (72%). This was followed by cold/rhinorrhoea which was present in 61 (68%). Wheeze was present in 33(37%), fast breathing was present in 34(38%). In our study, Group A had mean duration of symptoms of 4.7 days, Group B had 4 .9 days and Group C had 5.3 days. There was no significant difference between the three groups. There was improvement in all the 3 Groups after 24 hrs and after 72 hrs when compared to admission but there was significant reduction in HR, RR ,RDAI ,and improvement in saturation after 24 hrs in Group B, when compared to other Groups. This showed nebulised adrenaline brought about rapid symptomatic improvement in the condition.

LIMITATIONS

Our study was a hospital based time bound study.

The sample size was small.

Follow-up of cases need to be done.

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	Duration of symptoms	Cold, Rhinorrhoea	Cough	Fever	Wheeze	Fast breathing	Chest indrawing	Others	h/o Similar complications	h/o Steroids in past	Asthma in family	Temp.	HRAdmission
1	C	Mahesha	3 months	F	edapadi	99260	5.11.15	8 days	P	P	P	P	P	P		N	N	N	36.8	128
2	B	Jeevandhi	6 months	F	Kondalampatti	25518	5.11.15	5 days	p	p	p	p	p	p		N	N	N	36.6	171
3	C	Mouliasa	11 months	F	Kalarampatty	26091	16.11.15	5 days	p	p	p	p	p	p		N	N	N	38.7	168
4	C	Padma	4 months	F	Krishnagiri	10170	17.11.15	3 days	p	p	p	p		p		N	N	N	38.2	162
5	B	jayasree	2 months	F	Kannankuruchi	26167	17.11.15	8 days		p	p	p	p	p		N	N	N	37.8	156
6	C	hariharan	11 months	M	settichavadi	26213	17.11.15	6 days	p	p	p	p	p	p		N	N	N	37.6	156
7	A	ruthran	12 months	M	Omalur	26751	19.11.15	7 days	p	p	p					N	N	N	39.2	110
8	B	divyasree	2 months	F	Neikkarapatti	26547	23.11.15	2 days	p	p	p					N	N	N	36.8	126
9	B	rithikshan	7months	M	Vazhapadi	26751	23.11.15	5 days	p	p			p	p		N	N	N	38.5	130
10	A	Nithish	3 months	M	Gajagayakanbati	27731	30.11.15	3 days	p	p	p					N	N	N	36.8	121
11	B	Yadav	9 months	M	Nethimedu	27447	3.12.15	5 days	p	p	p		P			N	N	N	37	112
12	C	Cristina	4 months	F	Ayyodhiyapatnam	10645	3.12.15	6 days	p	p	p					N	N	N	37	140
13	A	Varun	10 months	M	Periyaveeranam	28035	7.12.15	5 days	p		p					N	N	N	36.5	142
14	B	Sharmith	7 months	M	Chinnakoundapuram	27947	7.12.15	2 days	p			p				N	N	N	37.6	160
C	C	B/o buvaneshwari	3 months	M	Valapadi	27956	7.12.15	4 days		p		p				N	N	N	36.9	168
16	A	Praveenkumar	2 months	M	Omalur	24989	7.12.15	4 days	p	p	p					N	N	N	36.7	164
17	B	Yogeshwaran	2 months	M	Veeranam	28053	7.12.15	5 days	p	p	p	P				N	N	N	37	142
18	C	Tamilanbu	10 months	M	Nalapari	83462	12.12.15	10 days		p	p					N	N	N	36.9	128
19	A	Mugutnhan	7 months	M	Cuddalore	83630	15.12.15	3 days	p	p	p					N	N	N	37.4	160
20	B	Akash	3 months	M	Kaliamman street	24645	18.12.15	5 days	p	p	p	P				N	N	N	37.2	110
21	B	Balaji	7 months	M	A.K Colony	25529	22.12.15	5 days	p	p	p					N	N	N	37	118
22	A	Mukilan	2 months	M	Anathanapatti	55216	22.12.15	1 day		p			p			N	N	N	37.4	132
23	B	Yoga sree	3 months	F	Pichipalayam	85092	22.12.15	8 days	p	p	p		p			N	N	N	37	136
24	B	M.Mukilan	8 months	M	cudalore	83630	27.12.15	4 days		p		p				N	N	N	36.8	110
25	A	dhanush raja	10 months	M	Kalarampatty	95716	29.12.15	4 days	p	p						N	N	N	37.3	128
26	B	Rithik raja	3 months	M	Omalur	25279	29.12.15	15 days	p	p	p	p				N	N	N	37	180
27	C	harikrisnan	3 months	M	kondanayakampatti	25577	29.12.15	6 days		p	p					N	N	N	38.5	112
28	A	Sashwin	12 months	M	Valapadi	64031	2.2.16	7 days		p		P	P			N	N	N	37.6	134
29	C	shyam	5 months	M	Karikdu	69701	5.2.16	8 days	p	p						N	N	N	36.6	150
30	C	Aradhana	14 months	F	Kichipalayam	80192	9.2.16	3 days	p	p						N	N	N	37.7	128

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	Duration of symptoms	Cold, Rhinorrhoea	Cough	Fever	Wheeze	Fast breathing	Chest indrawing	Others	h/o Similar complications	h/o Steroids in past	Asthma in family	Temp.	HRAdmission
31	B	Dhaniksha	12 months	F	Magudanchavadi	8628	12.2.16	5 days	p	p	p					N	N	N	36	116
32	B	Gowtham	6 months	M	Dhadhagapati	10216	24.2.16	7 days	p	p					loose stools	N	N	N	37	132
33	A	Amirtha nila	6 months	F	Karipatti	10244	19.2.16	4 days	p	p		P	P			N	N	N	36.9	130
34	A	Jessi	4 months	F	Sanyasikundu	10265	19.2.16	8 days	p	p		P		P		N	N	N	366	130
35	B	Samaya	4 months	F	kicchipalayam	11136	23.2.16	1 day		p	p		P		Refusal of feed	N	N	N	38.5	142
36	C	Solomon	9 months	M	Jagirchinmapalayam	16774	18.3.16	9 days	p	p	p					N	N	N	39	128
37	A	Athefa	7 months	F	Ammapet	16774	18.3.16	7 days	p	p	p					N	N	N	37	124
38	B	Devendran	6 months	M	Idapadi	17794	22.3.16	1 day	p	p	p		p			N	N	N	37	172
39	C	Illavarsan	11 months	M	Gugai	19906	31.3.16	4 days	p	p	p					N	N	N	36.7	110
40	C	Raman	2 months	M	Erumapalayam	23566	14.4.16	2 days		p		P		P		N	N	N	369	146
41	A	Neha	7 months	F	Sanyasikundu	23639	14.4.16	15 days		p	p			p	vomiting	N	N	N	37.4	178
39	B	Illavarsan	11 months	M	Gugai	19906	31.3.16	4 days	p	p	p					N	N	N	36.7	110
43	A	Illakkiya	18 months	F	Uthamasolapuram	24402	21.4.16	3 days	p	p	p					N	N	N	37.5	148
44	B	lingesan	2 months	M	Kitchipalayam	26322	25.4.16	4days	p	p	p					N	N	N	38.8	198
45	C	Rajesh	3months	M	Thiruvakoundanoor byepass	27999	2.5.16	4 days	p	p	p		p			N	N	N	37.8	142
46	A	Inisha	6months	F	pallapatti	30085	9.5.16	4 days	p	p	p		p			N	N	N	36.9	120
47	B	Sreegokulan	4 months	M	Ammapet	30131	12.5.16	3 days		p	p		p			N	N	N	36.7	120
48	A	Haswanth	6 months	M	Thirupathur	30158	12.5.16	6 days		p					loose stools	N	N	N	36.7	135
49	A	B/O Kanagavalli	5 months	M	vedathampatti	20200	17.5.16	3 days		p	p	p				N	N	N	36.7	129
50	B	Yugesh	4 months	M	Sathyanagar	21209	17.5.16	5days	p	p	p		p			N	N	N	37	110
51	C	Roja	6months	F	Kichipalayam	30904	18.5.16	4 days		p	p		P			N	N	N	37.8	118
52	A	Gomathi	9 months	F	Namakkal	31009	18.5.16	1 day	p	p	p					N	N	N	37.6	110
53	B	Megatheswaran	8 months	M	Mettur	32726	23.5.16	3 days	p	p						N	N	N	36.8	128
54	C	kalikishore	4 months	M	Dhadhagapati	28388	26.5.16	4 days	p	p	p					N	N	N	36.9	110
55	A	Kousalya	9 months	F	Omalur	26469	28.5.16	10 days		p		P	P			N	N	N	37.5	130
56	B	Poornima	16 Months	F	kandhampatti	30331	28.5.16	1 day	p	p	p					N	N	N	37	108

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	Duration of symptoms	Cold, Rhinorrhoea	Cough	Fever	Wheeze	Fast breathing	Chest indrawing	Others	h/o Similar complications	h/o Steroids in past	Asthma in family	Temp.	HRAdmission
57	C	Dhanuksha	11 months	F	Omalur	38884	29.5.16	3 days	p	p	p				Nasal block	N	N	N	37.9	124
58	A	Tamilarasi	3 months	F	Thattambatti	40437	2.6.16	8 days		p	p	P	P	P		N	N	N	36.8	128
59	B	Kathirvel	6 months	M	Tiruchengodu	40463	12.6.16	5 days	p	p	p	P	P	P		N	N	N	36.6	171
60	A	Harini	6 months	F	Tammanaiakkampatti	38708	14.6.16	4 days	p	p	p					N	N	N	368	129
61	A	Haridhar	4 months	M	kichipalayam	36550	16.6.16	3 days	p	p	p	P		P		N	N	N	38.2	162
62	B	Madhan	3 months	M	Namakkal	40179	20.6.16	8 days		p	p	P	P			N	N	N	37.8	156
63	C	Alagesan	11 months	M	A D street	41127	20.6.16	4 days	p	p	p	P	P	P		N	N	N	37.6	156
64	C	Deepadharshan	12 months	M	Kondalampatti	42768	23.6.16	7 days	p	p	p					N	N	N	39.2	110
65	B	Yukesh	7 months	M	Omalur	13643	23.6.16	2 days	p			P				N	N	N	27.6	160
66	C	Varshini	3 months	F	Muthmpati gate	42769	23.6.16	2 days		p		P				N	N	N	36.9	168
67	A	Krithikesh	3 months	M	Kichipalayam	42857	26.6.16	4 days	p	p	p					N	N	N	36.7	164
68	B	Darshan	2 months	M	Vadapatti	44129	26.6.16	5 days	p	p	P	P				N	N	N	37	142
69	A	Poornima	6 months	F	kandhampatti	30331	30.6.16	6 days		p					loose stools	N	N	N	36.7	135
70	A	Srepriya	5 months	M	Pachapatti	24632	30.6.16	3 days		p	p	P				N	N	N	36.7	129
71	B	Kavya	6 months	F	Kondalampatti	45518	1.07.16	5 days	p	p	p	p	p	p		N	N	N	36.6	171
72	C	Saicharan	11 months	M	settichavadi	46713	1.7.16	4 days	p	p	p	p	p	p		N	N	N	37.6	156
73	C	Kanisk	12 months	M	Omalur	48731	2.7.16	7 days	p	p	p					N	N	N	39.2	110
74	B	Karthick	9 months	M	Nethimedu	46547	2.7.16	5 days	p	p	p		P			N	N	N	37	112
75	C	B/o Sundari	3 months	M	Valapadi	47856	4.7.16	7 days		p		p				N	N	N	36.9	168
76	A	Jeeva	2 months	M	Omalur	44989	4.7.16	4 days	p	p	p					N	N	N	36.7	164
77	B	Saranya	3 months	F	Kichipalayam	45092	6.7.16	8 days	p	p	p		p			N	N	N	37	136
78	B	Hari	8 months	M	cudalore	43630	6.7.16	5 days		p		p				N	N	N	36.8	110
79	A	Sabari	2 months	M	Anathanapatti	45216	7.7.16	1 day		p			p			N	N	N	37.4	132
80	C	Akshya	4 months	F	kicchipalayam	41136	8.7.16	1 day		p	p		P		Refusalof feed	N	N	N	38.5	142
81	C	Venkat	9 months	M	Jagirchinmapalayam	46774	8.7.16	9 days	p	p	p					N	N	N	39	98
82	A	Gayathri	4 months	F	Sanyasikundu	40265	8.7.16	8 days	p	p		P		P		N	N	N	366	130
83	A	Shankar	4 months	M	Ammapet	40131	9.7.16	3 days		p	p		p			N	N	N	36.7	120
84	C	Surendar	11 months	M	Gugai	49906	9.7.16	6 days	p	p	p					N	N	N	36.7	110

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	Duration of symptoms	Cold, Rhinorrhoea	Cough	Fever	Wheeze	Fast breathing	Chest indrawing	Others	h/o Similar complications	h/o Steroids in past	Asthma in family	Temp.	HRAdmission
85	C	Saranya	9 months	F	Omalur	46469	10.7.16	10 days		p		P	P			N	N	N	37.5	130
86	A	Dinesh	4 months	M	Ammapet	50131	11.7.16	3 days		p	p		p			N	N	N	36.7	120
84	C	Surendar	11 months	M	Gugai	49906	9.7.16	6 days	p	p	p					N	N	N	36.7	110
88	A	Vinoth	10 months	M	Kalarampatty	45716	12.7.16	4 days	p	p						N	N	N	37.3	128
89	C	srihari	4 months	M	Ammapet	40131	12.7.16	3 days		p	p		p			N	N	N	36.7	120
90	C	priya	6months	F	Kichipalayam	40658	14.7.6	8 days		p	p		P			N	N	N	37.8	118

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	HR24 hrs	HR72 hrs	RRAdmission	RR24 hrs	RR72 hrs	RRSpO2-O2	SPAdmission	SP24 hrs	SP72 hrs	RAdmission	R24 hrs	R72 hrs	Retractions	Rhonchi	Hb	TC
1	C	Mahesha	3 months	F	edapadi	99260	5.11.15	162	110	58	54	48	99	96	96	96	7	2	0	Y,scr,icr	P	10.2	9600
2	B	Jeevandhi	6 months	F	Kondalampatti	25518	5.11.15	112	118	42	44	30	98	93	98	98	12	9	4	Y,scr,icr	P	8.7	17800
3	C	Mouliasa	11 months	F	Kalarampatty	26091	16.11.15	110	112	66	58	54	98	93	97	93	14	4	0	Y,scr,icr	P	10.2	13800
4	C	Padma	4 months	F	Krishnagiri	10170	17.11.15	128	120	36	36	36	96	80	96	84	14	14	13	Y,scr,icr	P	10.6	12200
5	B	jayasree	2 months	F	Kannankuruchi	26167	17.11.15	134	120	40	38	36	98	96	96	96	12	7	3	Y,scr,icr	P	10.2	9000
6	C	hariharan	11 months	M	settichavadi	26213	17.11.15	118	118	72	38	50	99	96	96	97	13	9	0	Y,scr,icr	P	9.8	9700
7	A	ruthran	12 months	M	Omalur	26751	19.11.15	112	112	60	66	76	98	96	93	96	6	4	2	Y,scr,icr	P	9.2	11400
8	B	divyasree	2 months	F	Neikkarapatti	26547	23.11.15	128	122	34	38	44	98	94	96	96	9	5	0	Y,scr,icr	P	11.5	14400
9	B	rithikshan	7months	M	Vazhapadi	26751	23.11.15	110	122	80	52	44	99	98	99	99	10	6	2	Y,scr,icr	P	11	5600
10	A	Nithish	3 months	M	Gajagayakanbati	27731	30.11.15	140	115	64	36	24	99	98	99	99	10	5	0	Y,scr,icr	P	9.7	8600
11	B	Yadav	9 months	M	Nethimedu	27447	3.12.15	130	100	64	20	30	98	98	97	98	8	3	0	Y,scr,icr	P	10.5	11400
12	C	Cristina	4 months	F	Ayyodhiyapatnam	10645	3.12.15	150	115	62	40	56	96	96	96	97	14	9	4	Y,scr,icr	P	11	10660
13	A	Varun	10 months	M	Periyaveeranam	28035	7.12.15	124	112	52	48	42	96	88	96	96	7	7	3	Y,scr,icr	p	9.2	12700
14	B	Sharmith	7 months	M	Chinnakoundapuram	27947	7.12.15	122	126	36	32	30	98	92	98	98	11	7	3	Y,scr,icr	P	11.5	9000
C	C	B/o buvaneshwari	3 months	M	Valapadi	27956	7.12.15	118	148	56	38	40	98	95	98	98	12	6	3	Y,scr,icr	P	11.6	7000
16	A	Praveenkumar	2 months	M	Omalur	24989	7.12.15	162	123	36	58	33	96	92	93	97	13	8	5	Y,scr,icr	P	11.1	9800
17	B	Yogeshwaran	2 months	M	Veeranam	28053	7.12.15	112	122	38	34	32	90	98	85	94	10	6	0	Y,scr,icr	P	9.7	11700
18	C	Tamilanbu	10 months	M	Nalapari	83462	12.12.15	150	112	42	34	35	98	98	99	99	10	10	0	Y,scr,icr	P	9.8	13000
19	A	Mugutnhan	7 months	M	Cuddalore	83630	15.12.15	110	126	44	36	28	97	94	97	98	7	4	0	Y,scr,icr	P	11.2	9800
20	B	Akash	3 months	M	Kaliamman street	24645	18.12.15	125	106	56	36	30	98	97	97	98	9	3	0	Y,scr,icr	P	11.5	12500
21	B	Balaji	7 months	M	A.K Colony	25529	22.12.15	110	100	50	44	32	97	96	98	99	9	5	2	Y,scr,icr	P	9.8	13400
22	A	Mukilan	2 months	M	Anathanapatti	55216	22.12.15	128	116	66	40	35	97	96	96	97	14	10	8	Y,scr,icr	P	7.2	7900
23	B	Yoga sree	3 months	F	Pichipalayam	85092	22.12.15	140	120	60	28	32	98	98	90	98	14	5	0	Y,scr,icr	P	10	7400
24	B	M.Mukilan	8 months	M	cudalore	83630	27.12.15	110	108	42	48	38	98	98	99	98	12	6	0	N	P	7.8	8900
25	A	dhanush raja	10 months	M	Kalarampatty	95716	29.12.15	118	128	64	52	44	97	96	97	97	7	6	0	Y,scr,icr	P	10	13200
26	B	Rithik raja	3 months	M	Omalur	25279	29.12.15	110	112	48	30	40	98	97	98	99	7	5	3	N	P	11.4	17000
27	C	harikrisnan	3 months	M	kondanayakampatti	25577	29.12.15	150	112	34	32	32	98	97	97	98	7	3	0	Y,scr,icr	P	11.2	12000
28	A	Sashwin	12 months	M	Valapadi	64031	2.2.16	124	112	54	32	36	98	98	96	98	8	6	3	N	P	9.8	11700
29	C	shyam	5 months	M	Karikdu	69701	5.2.16	120	154	60	60	48	98	92	97	97	8	7	2	N	P	10.1	12200
30	C	Aradhana	14 months	F	Kichipalayam	80192	9.2.16	114	115	60	56	48	99	99	99	98	13	10	4	Y,scr,icr	P	11.9	11400

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	HR24 hrs	HR72 hrs	RRAdmission	RR24 hrs	RR72 hrs	RRSpO2-O2	SPAdmission	SP24 hrs	SP72 hrs	RAdmission	R24 hrs	R72 hrs	Retractions	Rhonchi	Hb	TC
31	B	Dhaniksha	12 months	F	Magudanchavadi	8628	12.2.16	142	106	60	40	42	98	98	98	99	9	4	0	Y,scr,icr	P	9.6	6540
32	B	Gowtham	6 months	M	Dhadhagapati	10216	24.2.16	124	122	64	60	30	98	98	92	97	7	6	0	Y,scr,icr	P	8.9	10200
33	A	Amirtha nila	6 months	F	Karipatti	10244	19.2.16	115	118	42	36	28	98	97	98	98	8	5	0	N	P	10	9400
34	A	Jessi	4 months	F	Sanyasikundu	10265	19.2.16	116	118	68	54	50	99	96	99	100	8	6	3	Y,scr,icr	P	12	9000
35	B	Samaya	4 months	F	kicchipalayam	11136	23.2.16	138	120	43	36	42	95	75	94	98	14	5	0	Y,scr,icr	P	11.2	12000
36	C	Solomon	9 months	M	Jagirchinmapalayam	16774	18.3.16	140	120	48	40	44	98	97	98	98	14	8	5	Y,scr,icr	P	9.1	12000
37	A	Athefa	7 months	F	Ammapet	16774	18.3.16	110	118	30	30	32	99	99	96	98	8	6	0	Y,scr,icr	P	11.1	7800
38	B	Devendran	6 months	M	Idapadi	17794	22.3.16	110	118	40	36	32	99	95	98	85	10	5	0	Y,scr,icr	P	10.3	15600
39	C	Illavarsan	11 months	M	Gugai	19906	31.3.16	128	122	50	54	36	98	98	97	99	14	6	0	Y,scr,icr	P	11.6	13000
40	C	Raman	2 months	M	Erumapalayam	23566	14.4.16	118	122	50	54	36	98	98	97	99	5	6	0	Y,scr,icr	P	9.3	6890
41	A	Neha	7 months	F	Sanyasikundu	23639	14.4.16	160	122	62	60	42	96	92	99	99	13	4	5	Y,scr,icr	P	11.7	18800
39	B	Illavarsan	11 months	M	Gugai	19906	31.3.16	115	142	60	38	35	99	97	78	97	11	8	2	Y,scr,icr	P	11.6	13000
43	A	Illakkiya	18 months	F	Uthamasolapuram	24402	21.4.16	112	112	52	42	32	98	92	98	98	14	6	3	Y,scr,icr	P	10.9	12300
44	B	lingesan	2 months	M	Kitchipalayam	26322	25.4.16	120	118	36	40	40	99	98	100	100	7	3	0	Y,scr,icr	P	8.6	9200
45	C	Rajesh	3months	M	Thiruvakoundanoor byepass	27999	2.5.16	110	122	44	36	32	98	95	96	96	10	7	7	Y,scr,icr	P	10.5	10900
46	A	Inisha	6months	F	pallapatti	30085	9.5.16	150	118	48	42	36	98	94	95	96	9	8	0	Y,scr,icr	P	10.8	13300
47	B	Sreegokulan	4 months	M	Ammapet	30131	12.5.16	114	114	58	54	48	98	97	96	98	8	5	3	Y,scr,icr	P	9.8	10700
48	A	Haswanth	6 months	M	Thirupathur	30158	12.5.16	118	110	58	54	40	98	90	99	98	13	4	3	Y,scr,icr	P	11.2	8900
49	A	B/O Kanagavalli	5 months	M	vedathampatti	20200	17.5.16	150	128	46	42	35	99	97	99	98	8	9	2	Y,scr,icr	P	9.8	10400
50	B	Yugesh	4 months	M	Sathyanagar	21209	17.5.16	106	114	56	44	38	99	97	96	98	6	4	0	Y,scr,icr	P	10	10300
51	C	Roja	6months	F	Kichipalayam	30904	18.5.16	118	130	64	60	56	99	97	98	98	9	2	0	Y,scr,icr	P	11.2	7800
52	A	Gomathi	9 months	F	Namakkal	31009	18.5.16	148	118	78	66	50	98	98	97	99	6	5	0	Y,scr,icr	P	11.2	10300
53	B	Megatheswaran	8 months	M	Mettur	32726	23.5.16	111	142	36	36	32	98	96	97	98	8	3	0	Y,scr,icr	P	10	18200
54	C	kalikishore	4 months	M	Dhadhagapati	28388	26.5.16	150	118	34	30	32	98	96	98	97	11	3	0	Y,scr,icr	P	7	11300
55	A	Kousalya	9 months	F	Omalur	26469	28.5.16	122	108	62	44	42	100	100	99	97	10	9	3	Y,scr,icr	P	11.7	11900
56	B	Poornima	16 Months	F	kandhampatti	30331	28.5.16	120	100	80	52	44	98	90	97	98	8	5	0	Y,scr,icr	P	11.5	10800

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	HR24 hrs	HR72 hrs	RRAdmission	RR24 hrs	RR72 hrs	RRSpO2-O2	SPAdmission	SP24 hrs	SP72 hrs	RAdmission	R24 hrs	R72 hrs	Retractions	Rhonchi	Hb	TC
57	C	Dhanuksha	11 months	F	Omalur	38884	29.5.16	148	118	36	32	30	98	96	99	99	8	5	3	Y,scr,icr	P	10	12300
58	A	Tamilarasi	3 months	F	Thattambatti	40437	2.6.16	148	110	70	42	40	98	96	96	96	7	5	0	Y,scr,icr	P	10.2	9600
59	B	Kathirvel	6 months	M	Tiruchengodu	40463	12.6.16	121	122	43	36	42	99	93	98	96	12	7	2	Y,scr,icr	P	8.7	13600
60	A	Harini	6 months	F	Tammanaiakkampatti	38708	14.6.16	110	110	64	32	32	99	99	99	100	8	6	0	Y,scr,icr	P	9.1	11900
61	A	Haridhar	4 months	M	kichipalayam	36550	16.6.16	110	126	64	50	46	96	96	96	84	14	14	13	Y,scr,icr	P	10.6	18000
62	B	Madhan	3 months	M	Namakkal	40179	20.6.16	118	121	40	36	32	98	96	96	96	12	8	3	Y,scr,icr	P	10.2	9000
63	C	Alagesan	11 months	M	A D street	41127	20.6.16	110	118	72	38	50	99	96	96	97	13	9	0	Y,scr,icr	P	9.8	9700
64	C	Deepadharshan	12 months	M	Kondalampatti	42768	23.6.16	114	112	42	44	30	98	96	93	96	6	4	2	Y,scr,icr	P	9.2	11400
65	B	Yukesh	7 months	M	Omalur	13643	23.6.16	110	130	80	52	44	98	92	98	98	11	6	2	Y,scr,icr	P	11.5	9000
66	C	Varshini	3 months	F	Muthmpati gate	42769	23.6.16	130	148	56	38	40	98	95	98	98	10	8	3	Y,scr,icr	P	11.6	7000
67	A	Krithikesh	3 months	M	Kichipalayam	42857	26.6.16	114	124	48	36	32	96	92	93	97	13	9	5	Y,scr,icr	P	11.1	9800
68	B	Darshan	2 months	M	Vadapatti	44129	26.6.16	111	118	44	32	30	99	98	100	100	7	5	0	Y,scr,icr	P	9.7	10700
69	A	Poornima	6 months	F	kandhampatti	30331	30.6.16	148	110	60	66	38	96	90	99	98	13	4	3	Y,scr,icr	P	11.2	8900
70	A	Srepriya	5 months	M	Pachapatti	24632	30.6.16	110	118	64	36	24	98	97	99	98	8	9	2	Y,scr,icr	p	9.8	10400
71	B	Kavya	6 months	F	Kondalampatti	45518	1.07.16	122	124	60	28	32	98	93	98	98	12	8	4	Y,scr,icr	P	8.7	17800
72	C	Saicharan	11 months	M	settichavadi	46713	1.7.16	122	118	72	38	50	99	96	96	97	5	3	0	Y,scr,icr	P	9.8	9700
73	C	Kanisk	12 months	M	Omalur	48731	2.7.16	110	112	42	44	40	98	96	93	96	6	4	2	Y,scr,icr	P	9.2	11400
74	B	Karthick	9 months	M	Nethimedu	46547	2.7.16	112	100	70	42	32	98	98	97	98	8	3	0	Y,scr,icr	P	10.5	11400
75	C	B/o Sundari	3 months	M	Valapadi	47856	4.7.16	115	148	56	38	40	98	95	98	98	10	6	3	Y,scr,icr	P	11.6	7000
76	A	Jeeva	2 months	M	Omalur	44989	4.7.16	132	123	66	40	35	96	92	93	97	13	10	5	Y,scr,icr	P	11.1	9800
77	B	Saranya	3 months	F	Kichipalayam	45092	6.7.16	130	128	48	40	40	98	98	90	98	14	6	0	Y,scr,icr	P	10	7400
78	B	Hari	8 months	M	cudalore	43630	6.7.16	109	106	38	34	32	98	98	99	98	6	3	0	N	P	7.8	8900
79	A	Sabari	2 months	M	Anathanapatti	45216	7.7.16	168	128	62	44	42	97	96	96	97	14	12	8	Y,scr,icr	P	7.2	7900
80	C	Akshya	4 months	F	kicchipalayam	41136	8.7.16	110	132	58	54	40	95	75	94	98	14	5	7	Y,scr,icr	P	11.2	12000
81	C	Venkat	9 months	M	Jagirchinmapalayam	46774	8.7.16	110	120	48	40	44	98	97	98	98	14	8	5	Y,scr,icr	P	9.1	12000
82	A	Gayathri	4 months	F	Sanyasikundu	40265	8.7.16	118	118	60	66	42	99	96	99	100	8	6	3	Y,scr,icr	P	12	9000
83	A	Shankar	4 months	M	Ammapet	40131	9.7.16	110	110	44	36	22	98	97	96	98	8	8	3	Y,scr,icr	P	9.8	10700
84	C	Surendar	11 months	M	Gugai	49906	9.7.16	115	122	50	54	36	98	98	97	99	5	6	0	Y,scr,icr	P	11.6	13000

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	HR24 hrs	HR72 hrs	RRAdmission	RR24 hrs	RR72 hrs	RRSpO2-O2	SPAdmission	SP24 hrs	SP72 hrs	RAdmission	R24 hrs	R72 hrs	Retractions	Rhonchi	Hb	TC
85	C	Saranya	9 months	F	Omalur	46469	10.7.16	110	122	50	54	36	98	98	97	99	5	6	0	Y,scr,icr	P	11.7	11900
86	A	Dinesh	4 months	M	Ammapet	50131	11.7.16	158	108	68	54	50	100	100	99	97	10	7	3	Y,scr,icr	P	9.8	10700
84	C	Surendar	11 months	M	Gugai	49906	9.7.16	132	132	70	42	32	98	97	96	98	8	8	3	Y,scr,icr	P	11.6	13000
88	A	Vinoth	10 months	M	Kalarampatty	45716	12.7.16	132	128	30	30	32	97	96	97	97	7	5	0	Y,scr,icr	P	10	13200
89	C	srihari	4 months	M	Ammapet	40131	12.7.16	115	132	70	42	38	98	97	96	98	8	8	3	Y,scr,icr	P	9.8	10700
90	C	priya	6months	F	Kichipalayam	40658	14.7.6	111	112	64	60	56	99	97	98	98	9	2	0	Y,scr,icr	P	11.2	7800

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	DC	CXR	Urine routine	blood culture	Urine culture	Duration of nebulisation	Duration of stay	Recieved antibiotics
1	C	Mahesha	3 months	F	edapadi	99260	5.11.15	P64,L40,E2	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
2	B	Jeevandhi	6 months	F	Kondalampatti	25518	5.11.15	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
3	C	Mouliasa	11 months	F	Kalarampatty	26091	16.11.15	P80,L15,E2	Hyperinflated with pneumonic patch	NAD	NAD	NAD	2 days	3 days	N
4	C	Padma	4 months	F	Krishnagiri	10170	17.11.15	P72,L19,E5	Patch in right upper lobe	NAD	NAD	NAD	6 days	6 days	N
5	B	jayasree	2 months	F	Kannankuruchi	26167	17.11.15	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
6	C	hariharan	11 months	M	settichavadi	26213	17.11.15	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
7	A	ruthran	12 months	M	Omalur	26751	19.11.15	P48,L45,E3	Hyperinflated	NAD	NAD	NAD	6 days	8 days	N
8	B	divyasree	2 months	F	Neikkarapatti	26547	23.11.15	P49,L49,E1	Hyperinflated	NAD	NAD	NAD	6 days	7 days	N
9	B	rithikshan	7months	M	Vazhapadi	26751	23.11.15	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	7 days	7 days	N
10	A	Nithish	3 months	M	Gajagayakanbati	27731	30.11.15	P25,L65,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
11	B	Yadav	9 months	M	Nethimedu	27447	3.12.15	P20,L71,E6	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
12	C	Cristina	4 months	F	Ayyodhiyapatnam	10645	3.12.15	P40,L53,E2	Hyperinflated	NAD	NAD	NAD	6 days	7 days	N
13	A	Varun	10 months	M	Periyaveeranam	28035	7.12.15	P40L58E1	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
14	B	Sharmith	7 months	M	Chinnakoundapuram	27947	7.12.15	P70L26E2	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
C	C	B/o buvaneshwari	3 months	M	Valapadi	27956	7.12.15	P38L61E1	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
16	A	Praveenkumar	2 months	M	Omalur	24989	7.12.15	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
17	B	Yogeshwaran	2 months	M	Veeranam	28053	7.12.15	P35,L60,E2	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
18	C	Tamilanbu	10 months	M	Nalapari	83462	12.12.15	P20,L72,E6	Hyperinflated	3-5 Pus cells	NAD	NAD	5 days	5 Days	N
19	A	Mugutnhan	7 months	M	Cuddalore	83630	15.12.15	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
20	B	Akash	3 months	M	Kaliamman street	24645	18.12.15	P27,L72,E3	Pneumonic patch in R upper lung field	NAD	NAD	NAD	6 days	6 days	N
21	B	Balaji	7 months	M	A.K Colony	25529	22.12.15	P45,L45,E3	Hyperinflated	NAD	NAD	NAD	3 Days	3 days	N
22	A	Mukilan	2 months	M	Anathanapatti	55216	22.12.15	P50,L45,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
23	B	Yoga sree	3 months	F	Pichipalayam	85092	22.12.15	P40,L54,E2	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
24	B	M.Mukilan	8 months	M	cudalore	83630	27.12.15	P72,L19,E5	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
25	A	dhanush raja	10 months	M	Kalarampatty	95716	29.12.15	P10,L81,E6	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
26	B	Rithik raja	3 months	M	Omalur	25279	29.12.15	P45,L50,E4	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
27	C	harikrisnan	3 months	M	kondanayakampatti	25577	29.12.15	P37,L58,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
28	A	Sashwin	12 months	M	Valapadi	64031	2.2.16	P32,L30,E6	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
29	C	shyam	5 months	M	Karikdu	69701	5.2.16	P43,L42,E2	Hyperinflated	NAD	NAD	NAD	3 days	3days	N
30	C	Aradhana	14 months	F	Kichipalayam	80192	9.2.16	P60,L35,E3	Pnneumonic patch	NAD	NAD	NAD	5 days	5 days	N

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	DC	CXR	Urine routine	blood culture	Urine culture	Duration of nebulisation	Duration of stay	Recieved antibiotics
31	B	Dhaniksha	12 months	F	Magudanchavadi	8628	12.2.16	P60,L45,E3	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
32	B	Gowtham	6 months	M	Dhadhagapati	10216	24.2.16	P23,L67,E6	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
33	A	Amirtha nila	6 months	F	Karipatti	10244	19.2.16	P40,L56,E2	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
34	A	Jessi	4 months	F	Sanyasikundu	10265	19.2.16	P14,L74,E10	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
35	B	Samaya	4 months	F	kicchipalayam	11136	23.2.16	P80,L15,E4	Pneumonic patch in R upper lung field	NAD	NAD	NAD	11 Days	11 days	N
36	C	Solomon	9 months	M	Jagirchinmapalayam	16774	18.3.16	P20,L73,E5	Pneumonic patch in L upper lung field	NAD	NAD	NAD	3 days	4 days	N
37	A	Athefa	7 months	F	Ammapet	16774	18.3.16	P50,L46,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
38	B	Devendran	6 months	M	Idapadi	17794	22.3.16	P32,l60,E6	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
39	C	Illavarsan	11 months	M	Gugai	19906	31.3.16	P36,L60,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
40	C	Raman	2 months	M	Erumapalayam	23566	14.4.16	P25,L65,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
41	A	Neha	7 months	F	Sanyasikundu	23639	14.4.16	p68,L28,E2	Hyperinflated	NAD	NAD	NAD	6 days	7 days	N
39	B	Illavarsan	11 months	M	Gugai	19906	31.3.16	P36,L60,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
43	A	Illakkiya	18 months	F	Uthamasolapuram	24402	21.4.16	P80L15E3	Pneumonic patch in R upper lung field	NAD	NAD	NAD	4 days	4 days	N
44	B	lingesan	2 months	M	Kitchipalayam	26322	25.4.16	P20L76E2	Hyperinflated	NAD	NAD	NAD	2days	2days	N
45	C	Rajesh	3months	M	Thiruvakoundanoor byepass	27999	2.5.16	P45L50E4	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
46	A	Inisha	6months	F	pallapatti	30085	9.5.16	P30L60E8	Hyperinflated	NAD	NAD	NAD	6 days	6days	N
47	B	Sreegokulan	4 months	M	Ammapet	30131	12.5.16	P89L21E8	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
48	A	Haswanth	6 months	M	Thirupathur	30158	12.5.16	P50L45E0	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
49	A	B/O Kanagavalli	5 months	M	vedathampatti	20200	17.5.16	P20L70E2	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
50	B	Yugesh	4 months	M	Sathyanagar	21209	17.5.16	P30,L56,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
51	C	Roja	6months	F	Kichipalayam	30904	18.5.16	P72,L19,E5	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
52	A	Gomathi	9 months	F	Namakkal	31009	18.5.16	P56,L36,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
53	B	Megatheswaran	8 months	M	Mettur	32726	23.5.16	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
54	C	kalikishore	4 months	M	Dhadhagapati	28388	26.5.16	P35,L55,E8	Pneumonic patch in R upper lung field	NAD	NAD	NAD	6 days	12 days	N
55	A	Kousalya	9 months	F	Omalur	26469	28.5.16	P20,L73,E5	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
56	B	Poornima	16 Months	F	kandhampatti	30331	28.5.16	P64,L32.E2	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	DC	CXR	Urine routine	blood culture	Urine culture	Duration of nebulisation	Duration of stay	Recieved antibiotics
57	C	Dhanuksha	11 months	F	Omalur	38884	29.5.16	P75,L23,E1	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
58	A	Tamilarasi	3 months	F	Thattambatti	40437	2.6.16	P46,L40,E2	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
59	B	Kathirvel	6 months	M	Tiruchengodu	40463	12.6.16	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
60	A	Harini	6 months	F	Tammanaiakkampatti	38708	14.6.16	P70,L21,E6	Pneumonic patch in r lower lobe	NAD	NAD	NAD	3 days	3 days	N
61	A	Haridhar	4 months	M	kichipalayam	36550	16.6.16	P72,L19,E5	Pneumonic patch in R upper lung field	NAD	NAD	NAD	6 days	8 days	N
62	B	Madhan	3 months	M	Namakkal	40179	20.6.16	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
63	C	Alagesan	11 months	M	A D street	41127	20.6.16	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
64	C	Deepadharshan	12 months	M	Kondalampatti	42768	23.6.16	P48,L45,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
65	B	Yukesh	7 months	M	Omalur	13643	23.6.16	P70,L26,E2	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
66	C	Varshini	3 months	F	Muthmpati gate	42769	23.6.16	P38,L61,E1	Hyperinflated	NAD	NAD	NAD	6 days	10 days	N
67	A	Krithikesh	3 months	M	Kichipalayam	42857	26.6.16	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
68	B	Darshan	2 months	M	Vadapatti	44129	26.6.16	P35,L60,E2	Hyperinflated	NAD	NAD	NAD	2 days	2 days	N
69	A	Poornima	6 months	F	kandhampatti	30331	30.6.16	P50,L45,E2	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
70	A	Srepriya	5 months	M	Pachapatti	24632	30.6.16	P20,L70,E2	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
71	B	Kavya	6 months	F	Kondalampatti	45518	1.07.16	P55,L40,E3	Hyperinflated	NAD	NAD	NAD	6 days	18 days	N
72	C	Saicharan	11 months	M	settichavadi	46713	1.7.16	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
73	C	Kanisk	12 months	M	Omalur	48731	2.7.16	P48,L45,E3	Hyperinflated	NAD	NAD	NAD	6 days	8 days	N
74	B	Karthick	9 months	M	Nethimedu	46547	2.7.16	P20,L71,E6	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
75	C	B/o Sundari	3 months	M	Valapadi	47856	4.7.16	P38L61E1	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
76	A	Jeeva	2 months	M	Omalur	44989	4.7.16	P35,L60,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
77	B	Saranya	3 months	F	Kichipalayam	45092	6.7.16	P40,L54,E2	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
78	B	Hari	8 months	M	cudalore	43630	6.7.16	P72,L19,E5	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
79	A	Sabari	2 months	M	Anathanapatti	45216	7.7.16	P50,L45,E3	Hyperinflated	NAD	NAD	NAD	6 days	6 days	N
80	C	Akshya	4 months	F	kicchipalayam	41136	8.7.16	P80,L15,E4	Pneumonic patch in R upper lung field	NAD	NAD	NAD	11 Days	11 days	N
81	C	Venkat	9 months	M	Jagirchinmapalayam	46774	8.7.16	P20,L73,E5	Pneumonic patch in L upper lung field	NAD	NAD	NAD	3 days	18 days	N
82	A	Gayathri	4 months	F	Sanyasikundu	40265	8.7.16	P14,L74,E10	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N
83	A	Shankar	4 months	M	Ammapet	40131	9.7.16	P89L21E8	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
84	C	Surendar	11 months	M	Gugai	49906	9.7.16	P36,L60,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N

S.no	Group	Name	Age	Sex	Address	IP. No.	Date of admission	DC	CXR	Urine routine	blood culture	Urine culture	Duration of nebulisation	Duration of stay	Recieved antibiotics
85	C	Saranya	9 months	F	Omalur	46469	10.7.16	P20,L73,E5	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
86	A	Dinesh	4 months	M	Ammapet	50131	11.7.16	P89L21E8	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
84	C	Surendar	11 months	M	Gugai	49906	9.7.16	P36,L60,E4	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
88	A	Vinoth	10 months	M	Kalarampatty	45716	12.7.16	P10,L81,E6	Hyperinflated	NAD	NAD	NAD	4 Days	4 days	N
89	C	srihari	4 months	M	Ammapet	40131	12.7.16	P89L21E8	Hyperinflated	NAD	NAD	NAD	3 days	3 days	N
90	C	priya	6months	F	Kichipalayam	40658	14.7.6	P72,L19,E5	Hyperinflated	NAD	NAD	NAD	5 days	5 days	N